MANDARIN CHINESE HERITAGE LANGUAGE MAINTENANCE AMONG MANDARIN-ENGLISH BI/MULTILINGUAL CHILDREN IN SASKATCHEWAN

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ABSTRACT

So far, there have been no significant studies in Canada or Saskatchewan that examine sociolinguistic factors (such as language attitude, language use, and language exposure) as well as a factor of age vis-à-vis heritage (Mandarin) language proficiency among Mandarin-English bi/multilingual children. Mandarin has prestige in China as the language of education and government, and the number of Mandarin speakers in Canada is increasing. However, more people in Saskatchewan speak Cantonese and Chinese dialects other than Mandarin. Thus, this study examines the Mandarin language proficiency of the bi/multilingual children from Chinese-speaking immigrant families in Saskatchewan, a province with a small demographic group of Mandarin language speakers and very little support for its maintenance as compared with other provinces, such as British Columbia and Ontario. In addition, this study explores what sociolinguistic factors contribute to Chinese immigrant children's language proficiency in these settings.

The relationship between language proficiency and sociolinguistic factors was investigated via the framework of Variationist Sociolinguistics. An audio-recorded narrative task was adopted to assess bi/multilingual (Saskatchewan) and monolingual (in China) children's oral Mandarin language proficiency. Objective linguistic proficiency parameters (vocabulary size, syntactic complexity, and fluency) were extracted from the sound records and compared bi/multilingual and monolingual children. Questionnaires and interviews were conducted to assess parents' and children's language attitudes and language use, and the children's language exposure in the home and social domains. Finally, statistical relationships were performed between contextual sociolinguistic factors and language proficiency parameters.

This study has shown that bi/multilingual children are overall successful in learning and maintaining Mandarin as a heritage language in Saskatchewan. While some of the critical results suggest that attending community-run Chinese heritage language schools plays an essential role in learning Mandarin, the most crucial indicator of Mandarin heritage language acquisition and maintenance is the positive attitudes of the parents towards the Mandarin as a heritage language. Of equal (if not greater) importance are their efforts to create a supportive and consistent home language environment, and to provide sufficient and varied (in terms of quality and quantity) Mandarin language input within the home and family. Since the Mandarin language is core to Chinese culture, this research offers recommendations to the Ministry of Education, Public School

Boards, and the University of Saskatchewan and Regina to promote Mandarin as a foreign language and as a heritage language. This would contribute to sound bilingualism among Mandarin heritage speakers and facilitate heritage language learning, acquisition, maintenance, and development.

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As a child who was raised by my grandparents, without the encouragement of my grandfather, I would not have pursued my PhD abroad. Though he now lives in heaven, he will always be with me in my heart, and he always motivated me to believe that "the knowledge changes the faith." This is the truth, but it is a truth that was challenging for a child who grew up in an underdeveloped small town and only started to learn English at around 13 years old while attending the middle school. Without following you, I would not have completed my PhD, particularly during my darkest times abroad when I had to raise my newborn while my husband left to take care of his mother during her fourth stage of lung cancer. When our family lost my mother-in-law, and when I was alone and suffered a car accident that caused psychological and physical pain resulting in depression, I almost lacked the bravery to continue my learning journey abroad.

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DEDICATION

For my family and relatives in China, my grandmother, parents, and aunty, who constantly supported and had faith in me through every single step of this journey.

For my family in Canada, especially my father-in-law, who helped take care of the child while I worked on finalizing this dissertation, my beloved husband Wei Li, and our lovely daughter XiangJia Li for your ever-present warmth, care, and love.

For Chinese immigrant families who strive to maintain the Mandarin language and heritage despite an unfavourable wider environment.

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CHAPTER 1
INTRODUCTION

As an immigrant mother trying to teach Mandarin Chinese to my daughter who was born and is being raised in Canada, Chinese-English bilingualism becomes a central subject of my interests both in research and in practice.

1.1 Background Information

1.1.1 Linguistic facets of Canada

Due to international migration, bi/multilingualism is on the rise in every region of Canada (Census Canada, 2016). In 2016, the number of Canadians who spoke a language other than English or French at home was over 7.7 million people (or 22.3% of total population), and 19.4% of Canadian population reported speaking more than one language at home (Census Canada, 2016). The largest increase in population with immigrant mother tongues occurred in Western Canada (over 414,269 individuals) and Ontario (over 352,745 individuals) between 2011 and 2016 (Census Canada, 2016). On the prairies, the proportion of immigrant population more than doubled between 2001 and 2016: the number of immigrants jumped from 6.9% to 17.1% in Alberta, from 1.8% to 5.2% in Manitoba, and from under 1.0% to 4.0% in Saskatchewan (Census Canada, 2016).

Because of the consistently growing immigrant population, 37.5% (2.2 million) of all Canadian children under the age of 15 were raised in immigrant families (Census Canada, 2016). By 2036, the number of immigrants in Canada is expected to increase even more, the percentage of both foreign-born immigrant children and second-generation (Canada-born with at least one foreign-born parent) children reaching between 39% and 49% when counted together (Census Canada, 2016). Around half of the immigrant children (48.1%) were of Asian descent, since the majority (61.8%) of recent newcomers to Canada immigrated from Asia (Census Canada, 2016).

The top two immigrant languages spoken by Canadians at home (as of 2016) were Mandarin (610,835 individuals) and Cantonese (594,030 individuals) (Census Canada, 2016). The examination of Mandarin as a heritage language is highly pertinent due to at least two major reasons.

First, speakers of Chinese languages, belong to the second-largest group of a visible minority population in Canada: immigrants from China and their Canada-born children and grandchildren (1,577,060 individuals) constitute 20.5% of all visible minorities (Census Canada, 2016). Second, Chinese language speakers are also worthy of attention in the light of recent discussions and political actions promoting racial equity, diversity and inclusion in Canadian society (Cardinal & Léger, 2018).

1.1.2 Mandarin Chinese in Canada and Saskatchewan

The first Chinese immigrants who landed on the western coast of Canada came for building a trading post in 1788 (Li, 1988). The subsequent inflow of Chinese settlers from Taiwan, Mainland China and the United States was caused by the Gold Rush of the 1850s and increased in the 1880s with the construction of the Canadian Pacific Railway (Li, 1988). Once the rail line had been completed, the Canadian government approved several discriminatory legislative acts to decrease the number of Chinese immigrants (Li, 1988). For example, 'the Chinese Immigration Act' of 1923 banned immigrants from China except for merchants, students, diplomats, and particular circumstances (Anderson, 2007). The act was repealed in 1947, and by the early 21st century, China had become one of the significant countries of origin among immigrants in Canada (Zong, 2009). Citizenship and Immigration Canada Statistics showed that the number of permanent residents who emigrated from Mainland China (where Mandarin is the majority mother tongue) considerably surpassed the number from Hong Kong (where Cantonese is widely spoken) after returning to Chinese sovereignty in 1997. For instance, from 1997 to 2007, more than 400,000 immigrants came to Canada from Mainland China compared to just 50,000 from Hong Kong, and from 2008 to 2017, around 296,937 individuals emigrated from Mainland China, whereas just 12,888 emigrated from Hong Kong (Citizenship and Immigration Canada, Facts and Figures: Immigration Overview). Thus, Mandarin is now more widely spoken in Canada than Cantonese.

Besides, Chinese languages make up the largest immigrant mother tongue group in Canada (Statistics Canada, 2016), the term 'mother tongue' referring to the language one learns first at home, provided that the language is still understood when the census is taken (Pendakur, 1990). When relocating to Canada, Chinese immigrants brought with them the languages they spoke in China, such as Mandarin, Cantonese, Wu (Shanghainese), Min Dong and Min Nan (Fukien, Chaochow, Teochow, and Taiwanese) (Census Canada, 2016). Due to the distinct sound and tone

systems of Chinese languages, people generally cannot understand one another if they speak Chinese languages other than Mandarin, especially when the languages are strongly dissimilar, such as Cantonese and Hakka, and in the languages of Southern China (Gordon, 2005). Therefore, Mandarin, also known as "putonghua/普通话 in Mainland China, guoyu/國語 in Taiwan, China, and huayu/華語 in Singapore" (He, 2008, p.3), is adopted and primarily used as a 'lingua franca' for social communication (Plumb, 2016).

In the People's Republic of China, Mandarin has been designated as the official language and was applied for the advancement of compulsory education in the 1950s (Gordon, 2005). Since Chinese languages (called dialects in China) are often mutually unintelligible, the Chinese writing system (known as Putonghua) was used to standardize the pronunciation of Chinese words (Wei & Hua, 2019). Even though Chinese characters had been utilized since the late Shang Dynasty (about 1200-1050 BCE), the standardized writing system was introduced only at the beginning of the 20th century (Wei & Hua, 2019). There are now two forms of Chinese writing system: a simplified and official script used in Mainland China and a traditional script used in other regions where Chinese is spoken (He, 2008). Mandarin has prestige in China as it is the language used for education and in the government, and its prestige in Canada is reflected in the growth of the number of Mandarin speakers (Statistics Canada, 2016).

In Canada, Mandarin Chinese is gaining prominence, as it is now spoken by more than 100,000 people, which is the highest number among twenty-three primary immigrant languages (Statistics Canada, 2016). Moreover, Mandarin ranks the highest in the "complete retention rates (over 80%)" when compared to other Chinese languages (e.g., Cantonese 73.1%) (Statistics Canada, 2016, see figure 1.1). Here, retention refers to mother tongue language spoken in immigrant homes (Statistics Canada, 2011, 2016), which is considered to be an indicator of that language's vitality among a given immigrant group and therefore relates to the maintenance of that language.

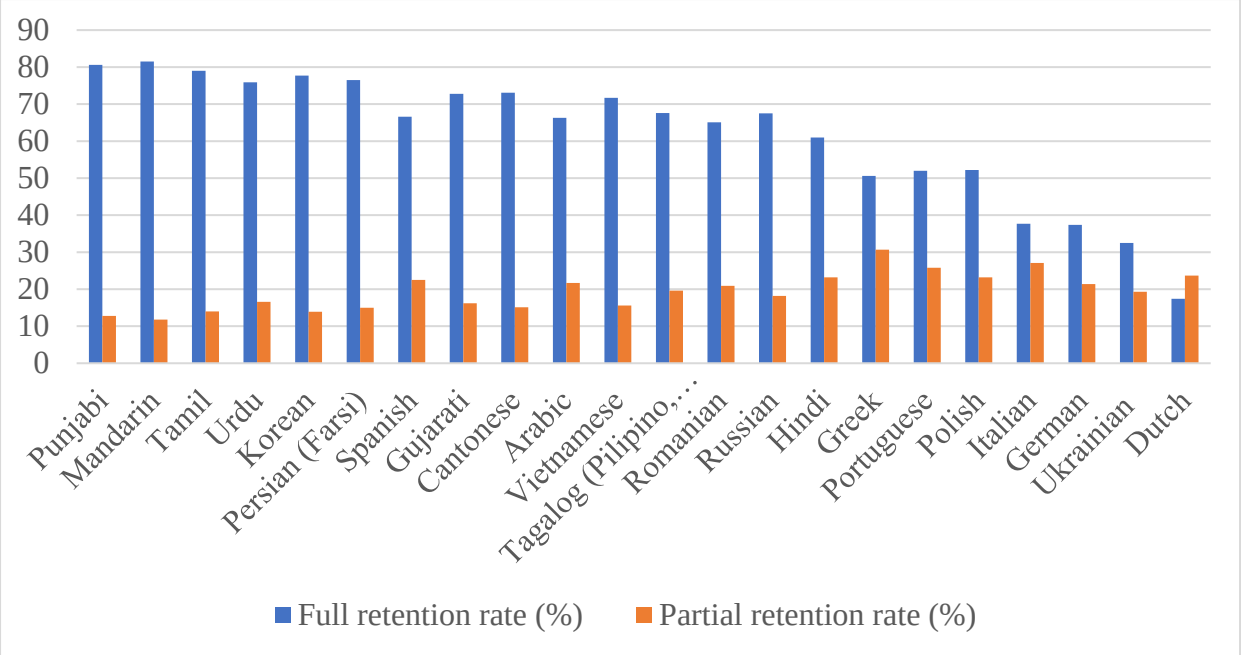

Figure 1.1 Full or partial retention rate for 22 primary immigrant mother tongues in Canada (based on data source: Statistics Canada, 2016).

In the context of immigrant minorities, their languages are known as immigrant languages or heritage languages (Nagy, 2018). In Canada, a heritage language speaker is any immigrant or their descendants whose mother tongue is not one of Canada's two official languages or an Indigenous language in Canada (Nagy, 2018). The relevance of heritage languages and their teaching and learning has increased in the past few decades as governments have recognized ethnocultural groups' demographic and political importance in Western Canada (Tavares, 2000). For instance, in 1997, *Saskatchewan Multicultural Education and Heritage Language Policies* mandated that "heritage language instruction in Saskatchewan has been funded both federally and provincially, and students through educational systems could get high school credits from heritage language courses instructed by community organizations" (Tavares, 2000, p.159).

Chinese languages were introduced into the education system across Canada in the early 1990s, including the Saskatchewan school board (Tavares, 2000). The introduction of Chinese as a second language in public schools reflected growth in the number of Chinese immigrants in Canada and the emergence of China as a new superpower in the global economy (Taveres, 2000). Mandarin is the most widely spread heritage language taught in Canadian secondary and higher education because it is the standard and official language of the Chinese government and education

(He, 2008). Ethnic radio channels and television stations, together with weekly newspapers and daily publications in Mandarin, have sprung up in abundance within Canadian cities that have significant Chinese immigrant populations, such as Vancouver and Toronto (Harrison, 2000). Compared with other Canadian provinces, Saskatchewan has a small community of Mandarin speakers; thus, it is one of the least spoken heritage languages in the province and is only spoken by 0.7% of the total provincial population (Census Canada, 2016, see figure 1.2). Respectively, Mandarin teaching in schools, community centres, and churches, and the support of Chinese languages in mass media is much less pronounced in Saskatchewan than in British Columbia and Ontario (Harrison, 2000). Hence, this thesis focuses on how Chinese immigrant families successfully maintain Mandarin as a heritage language with such limited language resources in Saskatchewan.

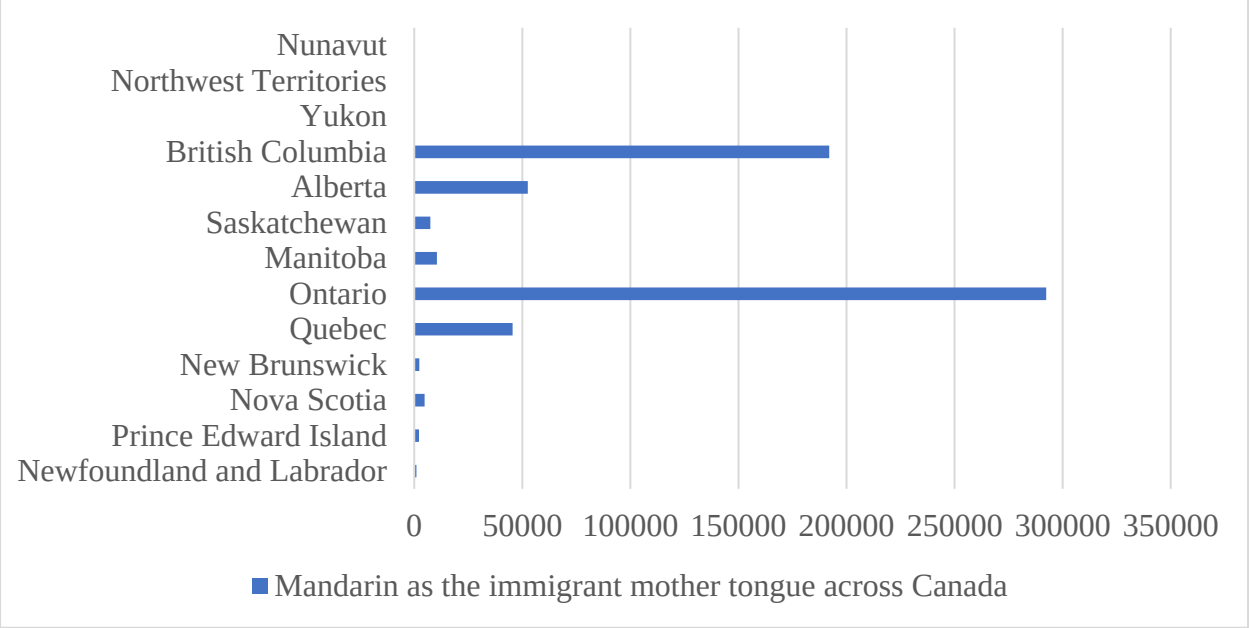

Figure 1.2 Mandarin spoken as an immigrant mother tongue across Canada (based on data source: Census Canada, 2016).

Indeed, heritage language maintenance in the linguistic group depends on the age of the immigrant group and its size as compared to other population groups (Pendakur, 1990), so when heritage language speakers come primarily from an older group, heritage language is not being passed onto the younger generation. The population of speakers of Mandarin as mother tongue in

Saskatchewan has grown over the last fifteen years (Statistics Canada, 2006, 2011, and 2016, see figure 1.3), boosted by the Saskatchewan Immigrant Nominee Program and joint student programs offered between the University of Saskatchewan and universities in China as well as by student exchange programs, such as the China Scholarship Council, supported by the Chinese government. Despite this population growth and these educational incentives, younger age groups in the Chinese community use Mandarin much less (such as the age of 0 to 14 and the age of 15 to 24, see figure 1.4) than speakers between 25 to 64 years old who most often speak it at home. Over the last two decades, the number of people in Saskatoon speaking Mandarin most often at home has decreased by age sharply, especially among the ages younger than 14-years-old (Statistics Canada, 2006, 2011, and 2016, see figure 1.5).

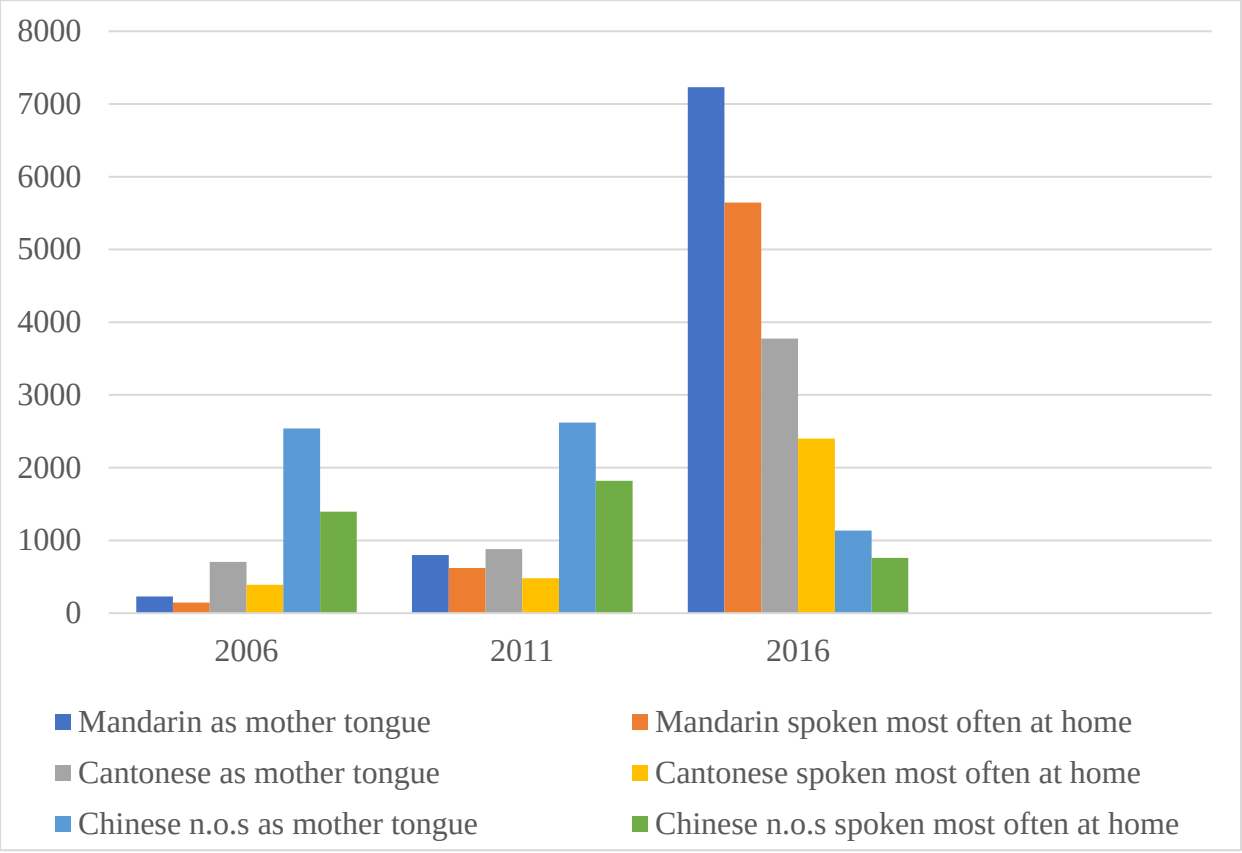

Figure 1.3 Chinese languages as mother tongue and spoken most often at home in Saskatchewan (based on data source: Statistics Canada, 2006, 2011, and 2016).

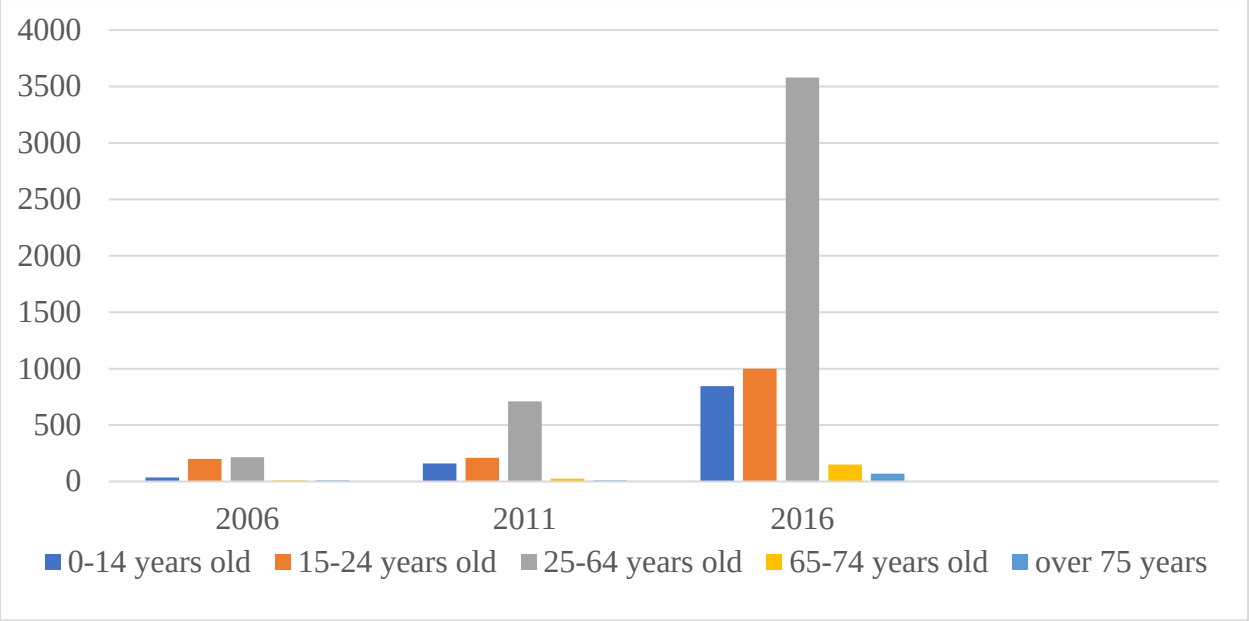

Figure 1.4 Mandarin spoken most often at home by different age groups in Saskatchewan (based on data source: Statistics Canada, 2006, 2011, and 2016).

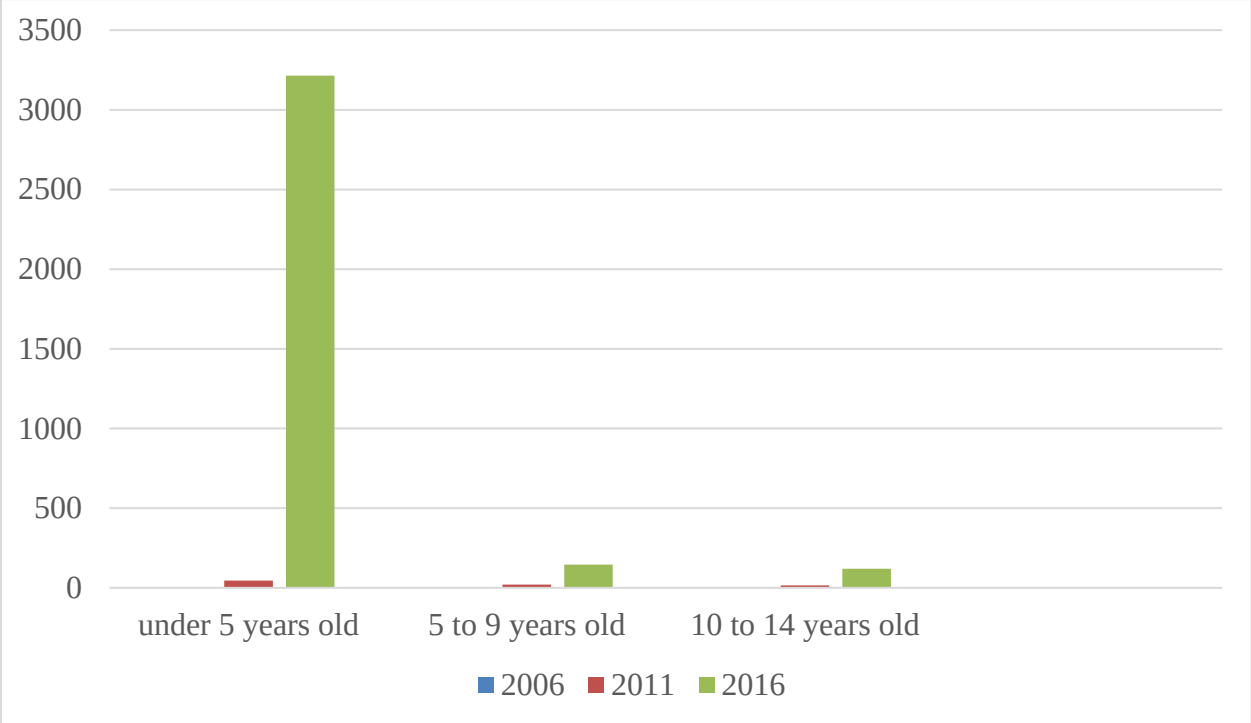

Figure 1.5 Mandarin spoken most often at home among ages 0 to 14 in Saskatoon (based on data source: Statistics Canada, 2006, 2011, and 2016).

Therefore, this study's primary goal is to investigate what sociolinguistic factors could

support Mandarin maintenance among children from Chinese-speaking immigrant families in Saskatchewan.

1.2 Statement of Problem

1.2.1 The challenges of language maintenance in immigrant families

Canada is a linguistically and culturally diverse nation in which immigrants constitute almost a quarter of the general population. Language is known to be the foremost assimilation issue immigrants must face in their new surroundings (Portes & Rumbaut, 2001), and proficiency in at least one Canada's official language is a prerequisite for immigrants' socio-economic success; however, immigrants' cultural and personal well-being are also closely related to their ability to maintain and hand down their mother tongue to subsequent generations (Harrison, 2000).

Second-generation immigrants are often represented as a group problematically stuck between two languages and cultures (Portes & Hao, 2002; Zhang, 2010; Kibler et al., 2014; Sevinç & Dewaele, 2018; Giguere & Hoff, 2020). During their childhood, second-generation immigrations are faced with a language choice dilemma: whether they should maintain their heritage language or shift to the majority language in their society (Zhang, 2010; Sevinç & Dewaele, 2018). Despite earlier research findings that second-generation immigrants shift to the dominant language much more commonly than they retain their heritage languages (Fishman, 1991, 2001; Portes & Rumbaut, 2001; Lanza & Svendsen, 2007; Kim & Starks, 2008), maintaining heritage languages in a dominant language environment has recently become an increasingly salient issue among immigrant families as parents grow more and more concern about passing their heritage culture and languages down to their children (Lee & Oxelson, 2006; Curdt-Christiansen, 2009; Kheirkhah & Cekaite, 2015; Budiyana, 2017).

The issue of heritage language maintenance is two-fold. On the one hand, it is a social matter determined by the ethnolinguistic vitality of a minority language (Allard & Landry, 1992). As a significant predictor of language survival or maintenance, ethnolinguistic vitality relates to subjective and objective factors, such as socio-structural contexts and psychological determinants (Allard & Landry, 1986; Landry & Bourhis, 1997). These factors address the demographic characteristics of a minority group (i.e., "absolute population numbers" and "geographic

concentration"), language status (i.e., "economic standing", "political power", and "linguistic prestige"), institutional support (i.e., "recognition of the group/language in the media", "education in the group's language", and "the legal status of the language according to the government") (Olko et al., 2020, p.6), the contact with the ancestral mainland, and the minority group's will to maintain its language (Nagy, 2018). On the other hand, language maintenance is also a matter of individual choices related to language attitudes of individual heritage speakers (Luo & Wiseman, 2000; Miller, 2017), including whether immigrant parents want their children to grow bilingually or monolingually (Park & Sarkar, 2007; Budiyana, 2017). Children also make their own linguistic choices related to their interest in the ancestral language and culture and their construction of their own identity and their goals in life (Zhang & Slaughter-Defoe, 2009; Hundt, 2019). Therefore, the maintenance of heritage language needs positive support both socially and individually.

1.2.2 Personal experience of raising a bilingual child

In addition to my research interest, I would like to share my personal experience of raising a bilingual child as an immigrant parent in the real life. My daughter was born in April 2017 and has been raised in Canada for the last four years. Based on my observation, she speaks English much more often than Chinese, even though Chinese is usually used and mostly spoken at home. She prefers to use English in most cases, probably because she has been attending English-speaking daycare since she was nine months old and has been exposed to an English-speaking environment for most of her time. Like most children, her language development escalated between age two and three. However, since that time (around her age three), she has been staying at home due to COVID-19 pandemic restrictions. I notice that she often responds to me in English even when I speak with her in Mandarin, prefers to watch cartoons in English rather than Chinese, and chooses to use English when she plays by herself.

Although my daughter can speak Chinese when required and understands what I say in Chinese, we still have some miscommunication because of her 'lexical gap' (Gibson et al., 2018) in Chinese. For instance, the word "放/play", which is used to describe the action of "playing the video/放视频", or "playing the music/放音乐"; however, she often incorrectly uses the word "玩/play" instead: "再玩一遍" to ask me to "play the video again", which is supposed to describe the

action of “playing games/玩游戏” or “playing videogames/玩游戏机”. She also sometimes misuses words that are pronounced similarly in English and Chinese, such as the word “伞/umbrella”, which is supposed to be pronounced as “san” in the third tone in Chinese, but she inaccurately pronounces it as “sun/太阳” in English-speaker’s way. Although she speaks English more often than Chinese in general, she can understand Chinese better than English to a certain extent. Due to staying at home for a year (2020.03-2021.03), her Chinese listening comprehension has improved mainly due to spending more time listening to and talking with her grandfather in Chinese at home. She can respond accurately in Chinese when being asked questions in Chinese, such as “你几岁了/how old are you?”, “你叫什么名字/what is your name?”, “你家里有哪些人/which family members do you live together with?”. However, she cannot answer these same questions in English due to limited exposure to English at home. Thus, to provide and increase her authentic English language input I encourage her to play with English-speaking neighbor children and attend English singing and dancing classes on weekends, rather than just watching English cartoons at home, and as a result, her listening comprehension in English gradually increases.

Based on my experience with the teacher from the daycare, I have noticed that, in fact, not every teacher in the public education system accepts children from immigrant families who do not speak English or have a distinct cultural background. For instance, the daycare teacher requested me several times to teach my daughter English at home rather than speaking Chinese as she thought English is more important and should be put as the priority. I also received the complaints from the same teacher about my child’s behaviour, such as refusing to eat an unpeeled apple (people usually peel apples in China but not in Canada). As a new immigrant in Canada, I have also experienced the pressures from the outside (such as in the workplace) to assimilate with the majority and become ‘Canadian’ both in speech and behaviour.

Thus, despite my determination to support my child’s maintenance of Chinese language and heritage, I understand that my journey of raising a bilingual child would be challenging. As the time goes by and my daughter gets exposed to more English language at school and through making social connections, I believe she can become Chinese-English bilingual and bicultural. For Mandarin language maintenance, she will need consistent, and efficient support by the family and community (see figure 1.6).

Figure 1.6 An example of Chinese characters (i.e., 小/small and 大/large) written by my daughter at the age of 3,6.

1.3 Purpose and Significance of the Study

The positive influence of heritage language maintenance on bi/multilingual children's cognitive development and academic skills has been demonstrated in earlier studies (Chiang, 2000; Tannenbaum & Berkovich, 2005; Zhang, 2009; Ingvalson et al., 2014; Zhang et al., 2019). Besides, heritage language maintenance has also been shown to positively impact successful majority language learning (Verhoeven, 1994; Lam et al., 2015; Sun et al., 2018; Savage & Pace, 2019). Moreover, heritage language maintenance and development can be pursued without any loss in proficiency or chances for future loss in proficiency in the majority language (Cummins, 2001; Bialystok et al., 2003; Yeong et al., 2014; Mayr et al., 2020). Furthermore, heritage language maintenance has been notably identified as a vital dimension of immigrants' adaptation experiences, as it benefits their well-being both psychologically and physically (Berry, 1990, 2017; Dewaele & Stavans, 2014; Sam, 2018; Zhang et al., 2018; Mueller et al., 2020). Therefore, it is essential to understand how well the children of immigrants acquire their heritage language and what sociolinguistic factors may contribute to their heritage language proficiency and maintenance.

However, due to the small community size, lack of direct contact with China, and the majority language and culture pressures, Mandarin seems to be declining in Saskatchewan (Statistics Canada, 2006, 2011, 2016). That said, no studies of Mandarin Chinese heritage language maintenance have ever been conducted in Saskatchewan. Therefore, this study targets one of the immigrant groups in Saskatchewan that has been so far neglected in sociolinguistic research:

heritage Mandarin-English bi/multilingual children. The study investigates the maintenance of Mandarin Chinese as a heritage language among second-generation immigrant children from Chinese-speaking immigrant families in Saskatoon. This study will provide a thorough understanding of the bi/multilingual children as Mandarin heritage speakers. However, it will also make recommendations for facilitating Mandarin heritage language teaching and learning to provide a resource for families, educators, and other interested parties in maintaining Mandarin Chinese as a rich and resourceful linguistic heritage in Canada. It also adds to the body of knowledge about Mandarin Chinese as a heritage language in general.

CHAPTER 2
LITERATURE REVIEW

This thesis draws on three major theories. The first of them is Heritage Language Acquisition which identifies interrelated factors in heritage language acquisition and proficiency, such as sociolinguistic factors involving 'sociopolitical status', 'vitality of the language', and 'access to schooling'; affective factors like 'attitude and identity'; contextual factors including 'linguistic practices at home and of social networks (peer groups)' and 'input and use (quantity and quality)' (Montrul, 2016, p.123). The second theoretical base is Bilingualism/Multilingualism that explores variable networks of bi/multilingualism from the interdisciplinary perspective, which involves both social variables (i.e., 'politics', 'institutions', and 'demography') and individual variables (i.e., 'age of arrival/exposure', 'parentage/family structure', and 'language ability (everyday/academic register; oracy/literacy; productive/receptive)' (Oriyama, 2012, p.169), and closely relates to language maintenance (Fishman, 2013). The third important theoretical framework is Family Language Policy, a discipline that explores family language policy, the 'explicit and overt planning in relation to language use within the home among family members' (King et al., 2008, p.907), that may involve parental and child language attitudes (Hu et al., 2014), language management (Spolsky, 2004), as well as language practices (Schwartz, 2010). Over the last two decades, the number of linguistic studies of heritage languages worldwide has increased significantly (Cummins, 2005; Montrul, 2008; Benmamoun et al., 2010; Jia et al., 2014; Scontras et al., 2015; Li & Duff, 2018; Polinsky & Scontras, 2020), and in particular, research on heritage speakers as bilingual language learners has attracted much attention (Pearson, 2007; Benmamoun et al., 2013; Polinsky, 2018; Sun & Verspoor, 2020; De Houwer, 2021).

2.1 Heritage Language and Heritage Speaker

2.1.1 Definition of a heritage language

The term 'heritage language' was initially adopted by the Ontario Heritage Language Program in Canada in the 1970s and American language policymakers began using it in the United

States since the 1990s (Fishman, 2001; Cummins, 2005; Polinsky & Kagan, 2007; Beaudrie & Fairclough, 2012; Wiley, 2014; Montrul, 2016; Kagan, 2017; Polinsky, 2018; Aalberse et al., 2019). In Canada, any language, excluding English, French, and Indigenous languages, which immigrants and their descendants use is considered heritage (Du, 2017). In the United States, the term is applied more generally to describe any minority language other than English, even those Aboriginal languages that existed in America before colonization (Beaudrie & Fairclough, 2012). In Australia and the United Kingdom, heritage languages are widely known as "community languages" (Beaudrie & Fairclough, 2012, p.5) and include immigrant and Indigenous languages (Kagan, 2017). Other commonly used terms for heritage language include 'mother tongue' (Lieberson, 1970), 'ancestral language' (Imbens-Bailey, 1996), 'home language' (Edwards et al., 1998), 'native language' (Valdés, 2000), or 'non-official language' (Chiswick & Miller, 2003). In short, since the term heritage language is identified with sociopolitical connotations that differentiate it from the majority language (Montrul, 2016), it is defined as an unofficial language that is used by a small subset of a population (Miller, 2017), such as the language spoken by immigrants and their children or their descendants (Valdés, 2000).

2.1.2 Definition of heritage speaker

Since heritage languages are differentiated by their local sociolinguistic determinants (Montrul, 2016), heritage speakers are defined differently depending on the country in which they reside. On the one hand, heritage speakers obtain a familiar association with a minority language (Fishman, 2001) because they are raised in a home where a language other than the majority language is spoken. They have varying degrees of familiarity with both the majority and their heritage language (Valdés, 2000). On the other hand, because heritage speakers tend to be exposed to heritage languages at home and official languages in social institutions (e.g., schools, churches, businesses, courts, etc.), they develop bilingual proficiency in both their majority and heritage languages (Montrul, 2008). If they begin acquiring their heritage language and their majority language at birth, heritage speakers are viewed as simultaneous bilinguals (Sun et al., 2020). However, when they acquire their heritage language as a mother tongue during the first years of their lives, heritage speakers are recognized as sequential (successive) bilinguals (Montrul, 2018), who have a weak and strong language, the former being their heritage language and the latter being their majority language (Polinsky, 2018).

In sum, heritage languages and heritage speakers are characterized according to six dimensions: the sociopolitical status of the heritage language; a shift in linguistic dominance from the heritage language to the majority language; the grammatical divergence of the heritage and majority languages; the heritage speaker's personal and familial connection to the heritage language; the age and mode of language acquisition; and the limitations of the heritage language within the heritage speaker's linguistic community (Aalberse et al., 2019). All these characteristics help understand Chinese as a heritage language in the Canadian context that will be discussed in the next subsection.

2.1.3 Bilingual competence of heritage speakers

Due to distinct sociolinguistic circumstances such as political, social, and family environments (Kupisch et al., 2013), a heritage speaker's bilingualism can be balanced or unbalanced in favour of their majority language (Polinsky, 2014). In North America, heritage languages (i.e., immigrant languages) are generally only widely spoken in the home since English is the societally dominant language and is used in all social institutions (Polinsky, 2014). Thus, many North American heritage speakers are raised in communities that foster subtractive bilingualism (Montrul, 2016), which indicates that a child's heritage language (which is often learned as a first language) retreats as the dominant language (second language) grows (Garcia, 2009). As a result, subtractive bilinguals usually process their dominant language more quickly than their heritage language (Polinsky, 2014), becoming more fluent in the dominant language and more proficient with its grammatical structures (Montrul, 2016). Heritage speakers, however, still develop and maintain some command of their heritage languages, such as the ability to aurally receive and orally produce the language (Montrul, 2016) because they are exposed to the heritage language in the family and home from birth (Polinsky, 2014).

Therefore, unbalanced bilingualism is "the norm" among heritage speakers in minority contexts since heritage languages are generally displaced culturally by the majority language that is spoken in all social, political, and legal institutions (Montrul, 2016, p.91). However, language competence can be developed in heritage and majority languages (LaFromboise et al., 1993; Miller, 2017), and bi/multilingualism is becoming increasingly valuable as the world moves toward multiculturalism (Coll & Magnuson, 2012; Carreira & Kagan, 2018). In the following sections, we will consider the reasons why heritage languages should be maintained, especially among second-

generation immigrants, and how this could be achieved.

2.2 Heritage Language Maintenance among Second-generation Immigrants

2.2.1 Definition of heritage language maintenance

Material objects (homes, possessions, lands) and immaterial actions (cultural rituals, languages) both constitute a person's heritage by passing down certain beliefs, ideologies and lifestyles from generation to generation (Aalberse et al., 2019). Thus, maintaining a heritage language is the opposite of language shift, which is a process of changing language use from a minority to a majority language when pressured by mainstream language, culture, and society (Fishman, 1991; Hornberger, 2002; Pauwels, 2016). However, avoiding language shift can be challenging because the heritage language must inevitably compete against a majority language with a greater social and cultural power (Mesthrie, 1996), and language maintenance is a challenge in immigrant groups living in bilingual and multilingual regions (Ningsih, 2018). Heritage speakers frequently decline to use their heritage language entirely, leading to the further dominance of the majority language (Wardhaugh, 2010) since heritage languages are most often passed on orally in the home or family context (or through 'inter-generational transmission') (Fishman, 1991; Jedwab, 2014). Indeed, heritage languages, unless they are consciously maintained, usually disappear following the three-generation model of language loss (or shift) (Pendakur, 1990; Portes & Hao, 1998; Fishman, 2001; Campbell & Christian, 2003; Holmes & Wilson, 2017), in which first-generation immigrants use the heritage language at home while learning the majority language and speaking an accented version of it in public. Second-generation immigrants speak the majority language unaccented in public while speaking the heritage language at home. Third-generation immigrants use the majority language at home and in public while knowing little of the heritage language. Thus, a special attention should be paid to second-generation immigrants who play a decisive role in preserving heritage languages.

2.2.2 Heritage language maintenance among second-generation child immigrants

Second-generation immigrants (bi/multilingual children growing up in immigrant families) connect the past and the future in immigrant families. They carry vestiges of both the immigrant culture and the new host country culture within their behaviours and languages, so they are thought

to be “the threats” to heritage language maintenance, but “the potential transformers” enhancing the bilingual or multilingual diversity of the society (Winter & Pauwels, 2007, p.180). In reality, the maintenance of heritage languages among many immigrants decreases in the second generation (Randolph Jr, 2017). In comparison to simultaneous bilinguals, second-generation immigrant children (as heritage speakers) are subtractive bilinguals in that they acquire the majority language only once they are exposed to it at schools, and they eventually come to speak the majority language in most cases as they are socialized through continued education and employment (Cho et al., 2004; Polinsky, 2015; Valdés et al., 2017).

In Canada, heritage speakers generally shift to using English or French at home in the first or second generation after immigration (Duff & Ava, 2017; Duff & Doherty, 2019) because English and French (in particular, the former) signal belonging to Canadian society and lead to acceptance and opportunity within Canada (Nieto, 2000). Language loss (or shift), where the majority language gradually replaces the heritage language, occurs in a few years, particularly among children born in Canada or who immigrated to Canada early before developing literacy in their heritage language (Cummins, 2006). Typically, maintaining a heritage language in Canada (or any other country) is challenging because children from immigrant families, particularly those enrolled in Canadian schools, are pressured to assimilate by adopting a majority language and can be stigmatized for using their heritage language in public (Duff & Becker-Zayas, 2017). In addition, heritage language educational materials are often scarce in their new countries, and educational institutions tend not to recognize immigrant children’s mastery of their heritage language and its knowledge (Locher-Lo, 2019).

There are many consequences to language shift among second-generation immigrants, including a loss of linguistic capital and any opportunities this capital brings to the child or the country in the global economy and a decrease in the child’s ability to communicate with the older generation and transmit the immigrant family’s pre-immigration culture (Cummins, 2006). Studies on heritage languages have been widely conducted in Canada in light of those challenges and the significance of maintaining heritage languages. For instance, a naturalistic exploratory inquiry was undertaken to examine supporting Bengali in Toronto (Subhan, 2007). By observing heritage language transmission between first-generation immigrants and their children at home, the author noted that parents focused on fostering cultural values and behaviours instead of maintaining their heritage language because English is primarily used for the practical needs of life in Canada, and

there was insufficient official (e.g., governmental or institutional) support in promoting heritage language learning and development (Subhan, 2007). A qualitative case study was undertaken to assess the maintenance and loss of Farsi/Persian in immigrant families in Manitoba (Babaee, 2014). By documenting students' successes and challenges in maintaining their heritage languages, this study identified heritage language maintenance issues (i.e., inequality) experienced by immigrants, highlighted the efforts made by immigrant families (i.e., parents) and communities (i.e., heritage language educators) for children to learn their heritage language, and advocated programming and policy increase heritage language maintenance opportunities for children from immigrant families in Canada (Babaee, 2014). Furthermore, heritage language maintenance and development among Asian immigrants were compared across five cities (Calgary, Toronto, Montreal, Vancouver, and Victoria) (Hong, 2016). All of the ethnic groups in the study were found to have positively facilitated their children's heritage language maintenance, although they used different degrees of involvement that applied distinct methods of heritage language education (Hong, 2016). Therefore, to support maintaining heritage languages in Canada, it is necessary to acknowledge what socio-linguistic factors are involved in this process.

2.3 Interrelated Factors in Heritage Language Maintenance and Proficiency

2.3.1 Social factors in heritage language maintenance and proficiency

Because it is used to communicate with others, language, at least in part, determines one's sociocultural experiences (Oriyama, 2012). Thus, heritage language maintenance and loss are significantly related to the heritage speaker's sociopolitical and situational circumstances (Bonvillain, 2000; Nieto, 2000; Portes & Rumbaut, 2001; Berry, 2006). Besides being primarily impacted by sociopolitical and situational conditions, the degree of heritage language acquisition and proficiency vary widely among heritage speakers (Montrul, 2016). Heritage language speakers are not always interested in maintaining their language, even if, as is the case with Mandarin Chinese, the heritage language has a vibrant future globally (Aalberse et al., 2019). In addition, as English has become a globally dominant language in governmental and educational institutions and is also widely used in interethnic and international communication, the acquisition and maintenance of heritage language can be viewed as having only limited benefit culturally, socially, and economically (King & Ennser-Kananen, 2012; Duff & Doherty, 2019).

Government language policy

If a heritage language has no social and political power, the language and its literature and culture will be easily threatened (Wardhaugh, 2010). The heritage languages spoken by immigrants in Canada are stigmatized as obstacles to social integration and economic advance because the Canadian government believes the development and modernization of the Canadian economy depend on linguistic uniformity (Bonvillain, 2000). Meanwhile, assimilation theory directed and instructed previous attitudes and policies towards immigrants, resulting in many ethnic languages, traditions, and ways of life disappearing as immigrants fit themselves and their traditions into Anglo-Canadian society (Chow, 2001). Consequently, heritage speakers often felt bullied, belittled, and shamed for speaking their heritage languages and heard derogatory remarks about heritage languages from the mainstream community and society (Blokland & Hasselblatt, 2003).

As assimilationism necessitates the abandonment of previous cultural ways of life (such as language) for the newcomers and thereby reduces the ethnic distinctions between people (Shoshana, 2011), the process of language loss (or shift) has become a worldwide tendency, especially in a minority or immigrant community (Holmes, 2013). The monolingual policy established earlier by the United States during WWI and WWII considered those who used foreign languages traitors (Bonvillain, 2000). This policy made English mandatory in schools, and teachers received mandated fines for speaking other languages in the classroom and children were often punished for speaking non-English mother tongues (Bonvillain, 2000). However, it did allow "a constitutional right" that minority communities could "speak their language in private" (Bonvillain, 2000, p.310). Despite Canada being a bilingual nation, the official status of English and French was not recognized by the Parliament until 1988 through 'the Official Language Act/Loi sur les langues officielles' (Gessner et al., 2018). In the same year, 'the Canadian Multiculturalism Act' was subsequently approved by the government (Gessner et al., 2018). Since the adoption of multiculturalism as an official policy (Chow, 2001), in its official documents, the Canadian government has not mentioned any support for maintaining and developing heritage languages or even that maintaining heritage languages is an integral part of avoiding assimilation (Ricento, 2013).

According to the recent Annual Report on the Operation of the Canadian Multiculturalism Act (Canadian Heritage 2019-2020), the stated objective of the Multiculturalism Program is to

remove the barriers related to racism and religious discrimination to ensure all Canadians can participate equally in Canadian society. As part of this push for equality, the Multiculturalism Program of the Department of Canadian Heritage is funding community-based anti-racist initiatives (e.g., community support for Black Canadian Youth), evidence-based multiculturalism policy, community outreach programs that enhance intercultural understanding and public awareness about multiculturalism in Canada, social institutions promoting initiatives that meet the practical and administrative goals of the Canadian Multiculturalism act, and initiatives that support Canada's international goals regarding multiculturalism (the Annual Report on the Operation of the Canadian Multiculturalism Act, 2019-2020). In essence, Canada officially supports multiculturalism as an ideology. However, it does so only broadly and does not have any specific means, practical guidelines, or solutions to help people or groups realize social harmony, let alone any fostering of linguistic diversity (Locher-Lo, 2019). For example, Multiculturalism grants were provided by the Canadian federal government for ethnic groups to celebrate their cultures and languages, e.g., "Canadian Multiculturalism Day", "Asian Heritage Month", and "Black History Month" (the Annual Report on the Operation of the Canadian Multiculturalism Act, 2019-2020); however, no direct funding was provided for teaching and learning heritage languages.

Following the Multiculturalism policy, language policy is seemingly developed by the Canadian government to achieve "social and linguistic diversity"; however, financial support for heritage languages has been inconsistent, with some provincial governments questioning the usefulness of publicly surrounding funding minority language education rather than majority language education (Duff & Ava, 2017, p.58). For example, in Saskatchewan, due to the economic situation in the province, the Saskatchewan Ministry of Education has pulled funding ($225,000CAD) from heritage language schools since 2016, which has put the future of heritage language schools in Saskatchewan in jeopardy (CBC News, 2016). Hence, to practically support ethnic groups and immigrants to maintain their heritage languages and cultures, an appropriate management of multicultural policy is required. This management could include providing freedom of expression in languages other than the official languages of Canada, modelling positive attitudes to social diversity to accommodate individuals from multiple linguistic and cultural backgrounds through social justice and educational systems (Nye, 2007; Dewaele & Botes, 2020).

Institutional language policy

By representing the language attitudes of the mainstream society, institutional language policy significantly affects heritage language acquisition and maintenance (Fishman, 1991; Zhang, 2005; Li & Duff, 2008; Taylor et al., 2008; Walter & Benson, 2012; Montrul, 2016). Immigrant students are impacted by a constant devaluation from the dominant society and the social inequalities in public schools, so students are often segregated based on their ethnicity, culture, or native language (Vedder & Horenczyk, 2006). Consequently, children who use minority languages (i.e., immigrant children and the children of immigrants) (Wu & Bilash, 2000) often refuse to speak their heritage languages at the risk of being alienated or labelled as having limited proficiency with the majority language (Nieto, 2000).

In Canada, even though a multicultural ideology that seeks to promote social equality and justice has been adopted by the government (Nye, 2007), immigrant and minority groups always experience pressures to assimilate via social and educational systems as well as via the majority languages, cultures, values, and norms (Holmes, 2013). Language policies in Canada have also been fluctuating between the tolerance of bilingualism and anti-bilingualism (Tavares, 2000) since the host society identifies bilingual programs as threats to the integrity of the dominant language and as a symbol of refusing to accommodate to the mainstream culture (Suárez-Orozco & Suárez-Orozco, 2009). In general, bilingual education can be defined as a program of education that employs two different languages of instruction. Yet, the primary objective of bilingual education in Canada is to develop proficiency and literacy in the majority language (i.e., English) and the child's heritage language is not used in the classroom (Nieto, 2000). Heritage language bilingual programs in Western Canada are not similar to the French immersion model that uses French in the classroom (Tavares, 2000). Rather than maintaining heritage languages, bilingual programs usually are transitional, meaning that heritage languages are only used as a tool to achieve dominant language competence (Suárez-Orozco & Suárez-Orozco, 2009). For instance, the heritage language is used in 95% of the class time in the first year, then reduced to 50% in the second year, and 5% to 10% in the third year (Bonvillain, 2000). Thus, even though transitional bilingual programs provided by educational institutions support acculturation, they do not strongly facilitate heritage language maintenance (Shoshana, 2011).

Besides, since bilingualism in Canada often refers to English and French, other languages have not been taken into account for several decades (Zhang & Guo, 2017). The minority language

bilingual program (Ukrainian-English) was first introduced in 1973 as a three-year pilot project that shared a unified curriculum framework with other schools in Alberta (Wu & Bilash, 2000; Sun, 2016). With the pilot project's success, Arabic, German, Hebrew, Polish, Spanish, and Mandarin bilingual programs were later set up in Western Canada (Saskatchewan and Manitoba) (Wu & Bilash, 2000; Sun, 2016). The Chinese-English bilingual program, initiated in 1982 by the Edmonton Public School Board, has become one of the most extensive bilingual programs in Edmonton (Sun, 2016) and consists of seven elementary schools, four junior high schools, and three senior high schools. This program has three functions: firstly, it aims to help Chinese minorities maintain their language and cultural heritage; secondly, it is a two-way bilingual program in which both Chinese and English-speaking students study together; and finally, it offers a transitional program that helps immigrant children learn English to prepare them for Canadian educational institutes (Wu & Bilash, 2000). Such Chinese bilingual programs help immigrants adapt to the mainstream culture while fostering positive self-esteem and identities in Chinese-English bilingual students (Wu & Bilash, 2000; Sun, 2016; Zhang & Guo, 2017).

In addition, by maintaining heritage languages and promoting bicultural competence, bilingual programs positively enhance the process of cognitive development (Hakuta & Diaz, 2014). Engaging in the Mandarin Chinese language bilingual program helps students maintain a connection to their cultural and linguistic heritage while also preparing them for the new culture they are entering, contributing to students' literacy achievement (Lam et al., 2015). When provided with balanced instruction in both Chinese and English, students develop significantly greater literacy skills and proficiency with both languages, and their vocabulary, phonological awareness, and morphological awareness in Chinese and English all improve (Koh et al., 2017). However, because China is becoming an important trading partner in the global economy, and Mandarin Chinese is so widely spoken in the modern economic world, the Mandarin Chinese bilingual program in Saskatchewan public schools is intended only to teach students to speak and understand the language rather than to read and write in Mandarin Chinese (SK Education – Mandarin 10, 20, 30: a curriculum guide for international languages). Due to this focus on oral communication, the question of whether or not the Mandarin Chinese bilingual program in Saskatchewan can positively and equally contribute to Chinese and English bilingual and biliteracy development remains uncertain, as only limited support (i.e., restricted funding allocation) is provided by the government and institutions. In turn, limited government funding requires more individual and community

efforts to facilitate heritage language learning, acquisition, and maintenance.

2.3.2 Contextual and individual factors in heritage language maintenance and proficiency

In addition to the sociocultural factors that affect heritage language acquisition and maintenance, individual factors such as heritage speakers' demographic background, their language use at home and within social networks, and their attitudes towards heritage languages (Fishman, 2001; Oriyama, 2012; Holmes, 2013; Montrul 2016) all influence the acquisition and maintenance of heritage languages. The loss of heritage languages is caused by shifting to the majority language and the erosion of understanding, speaking, reading, and writing in heritage languages (Fishman, 1991). Hence, heritage speakers can have radically different degrees of proficiency in their heritage languages (Montrul, 2016, 2020), and their acquisition and maintenance of heritage languages vary considerably depending on the respective quantity and quality of input and use in heritage languages (Polinsky, 2018; Kan, 2019; Sun & Yin, 2020).

Moreover, bilingual children's heritage language acquisition and proficiency are virtually affected by 'the input-proficiency-use cycle' (Pearson, 2007). In this cyclical form of learning, input from a proficient heritage language speaker builds the child's confidence until the child begins to use the heritage language more frequently, and the child's output engenders even more input from the proficient heritage language speakers, beginning the cycle once more (Sun et al., 2018). Therefore, to efficiently develop a heritage language (or mother tongue), a child needs to interact with proficient heritage language speakers and be exposed to information and experiences that can help the child practice literacy skills, such as reading, writing, and discussion (Benson, 2009). The developmental processes of immigrant children also include changes in psycho-social, biological, and cognitive domains (Berry et al., 2006) that are directly and indirectly affected by social circumstances, such as the home, community, and school (Quay & Montanari, 2016). In particular, acquiring and developing heritage language grammatical proficiency is closely related to the input factors and heritage language use in the child's home, school, and sociolinguistic community (Montrul, 2016).

Language use and exposure in the domain of the home and family

Because they tend to receive negative attitudes from the dominant culture and are viewed as inferior, heritage language speakers typically restrict their heritage language practices to the

home environment (Montrul, 2016). Essentially, a child's initiation into language comes within the home, which remains their closest language ecology until they leave home (Quay & Montanari, 2016). Thus, family is the key to reviving and maintaining heritage languages at the earliest periods, primarily via intergenerational transmission between the parents and children in the home (Zhang, 2020). Furthermore, family language choice and use crucially influence the maintenance of heritage languages over generations because all the other major domains of social life (such as schools, social institutions, and employment) and media (like TV, radio, and newspaper) are already dominated by the majority language (Budiyana, 2017).

Parents who raise bilingual children tend to use various language patterns among family members (De Houwer, 2007; Curdt-Christiansen, 2014) as a result of distinct economic, political, cultural, educational, and sociolinguistic circumstances (Rothman, 2007; Curdt-Christiansen, 2009; Duff et al., 2013; De Houwer, 2018). Indeed, in households where one or both parents regularly speak a language (e.g., heritage language) other than the majority language, the parent's language use is the prime predictor of the linguistic abilities of young children (Bonvillainm, 2000). The strategy of using heritage language only at home as a family language policy has been shown to successfully help children maintain heritage language (Chumak-Horbatsch, 1999). On the other side, children from immigrant families who are using English at schools and with parents at home maintain much less of their heritage languages (Rohani et al., 2006). Therefore, home language use is identified as an integral factor for successful bilingual development (Dewaele, 2000), and parents' language practices as well as family language policy can effectively transmit or block passing the heritage languages to their children (De Houwer, 1999; Schwartz, 2008; Kang, 2013; Mu & Dooley, 2015). Additionally, parents' language choices reflect the strength of their social identity and their attitudes towards the language, which, in turn, impact the children's motivation to maintain or abandon the heritage language (Kircher, 2019). For example, a case study of a Chinese immigrant family in New Zealand practising Chinese-English dual language development found that the mother's family language policy (speaking-Chinese-only) and heritage language practices at home successfully maintained her child's heritage language and bolstered the child's interests and learning needs in addition to bilingual development (Li, 2020).

In addition, parental or familial language policy theory (King & Fogle, 2013; Curdt-Christiansen, 2016; Said & Zhu, 2019) takes into account the parents' interaction types and the frequency of their language inputs in interactions with children (De Houwer, 2007; Hoff, 2013),

particularly as regards the amount and quality of exposure during the critical period of linguistic development from childhood to early puberty (Lenneberg, 1967; Bonvillain, 2000; Benmamoun et al., 2010; Montrul, 2018). As Montrul (2010) pointed out, without daily access and frequent exposure to and use of the heritage language during this critical period, children often fail to acquire the heritage language or demonstrate significant atrophy in their heritage language grammars. A recent heritage language study undertaken by Miller (2017) indicated that parents should continue to speak in their heritage language until their child is in at least grade five (age 10 and 11) because children often come to appreciate bilingualism by that time. There is less chance of shifting to English if parents persist with heritage-language-only interaction. Moreover, children's heritage language proficiency and bilingual development are crucially influenced by the richness of the home language environment (Sun et al., 2018), i.e., completion of language assignments (Xu, 1999), storytelling and dual language book reading (Taylor et al., 2008), media usage (e.g., sound, images, and a variety of digital media) (Norton & Toohey, 2011), and the amount of heritage language spoken by core family members and native-speakers (Sun et al., 2020). Parents' quantity and quality of language input differ by cultures and individual families; however, these differences result in variations in children's heritage language outcomes (Cabo & Rothman, 2012; Weisleder & Fernald, 2013; Tamis-LeMonda et al., 2014; Hirsh-Pasek et al., 2015).

In other words, children's heritage language performance and proficiency can be predicted by their heritage language exposure at home (Zhang & Koda, 2011; Gharibi & Boers, 2019; Liang & Shin, 2021). Li (2006) examined the reading and writing abilities of three Chinese-Canadian first and second graders (age 6 and 7) by accessing their language practices in Mandarin, Cantonese, and English at home, and this study found that three children's language choice, use, and competence were shaped significantly by their parents' consistency in maintaining their heritage language and the language instruction provided by their parents. Another study undertaken by Jia and Paradis (2015) showed that there were no significant differences, such as the "use of relative clauses and post-verbal NP placement" (p.737), in narrative outcomes between Mandarin-English bilinguals and Mandarin monolinguals if children from immigrant families were raised in robust Mandarin home environment. Furthermore, Sun (2019) confirmed the crucial role home language exposure played in heritage language learning and maintenance by exploring the Mandarin language and literacy home environment among 202 Mandarin-English preschoolers (age 4 and 5). In addition, this study highlighted that parental support positively affected bilingual children's early

language development and learning outcomes, mainly when parents ensured high amounts and quality of heritage language input, plenty of language practice time, and various opportunities for children to speak their heritage language and hear it spoken (Sun, 2019). In short, children's linguistic abilities in heritage language depend primarily on their exposure to the language in the home context.

Language use and exposure in the domain of heritage community

The successful maintenance of heritage languages is positively correlated with the immigrant family's involvement with the community (Ying, 1995) due to a dialectic relationship between speakers' linguistic behaviours and their interpersonal relations (see Milroy, 1982, 1987). Speakers' language use and social identities are primarily shaped by their social interactions (Wei, 1994). Zhang (2012) explored co-ethnic relationships by examining a group of Chinese immigrant family's social networking with their co-ethnic peers and communities. Most Chinese parents in this study stated that they had Chinese friends and engaged in the activities held by Chinese communities, and the resulting exposure to the Chinese language and culture led to a high rate of Chinese language maintenance among their children (Zhang, 2012). Therefore, some 'implicit and explicit actions' have been proposed to help immigrant families effectively maintain their heritage languages as follows: the implicit actions include living in a home that is close to ethnic neighbourhoods or surrounded by a heritage community, and the explicit activities involve conscious efforts that foster heritage language maintenance, such as encouraging children to communicate and interact with relatives and distant family members who speak heritage languages and offering children opportunities to access their heritage language and culture by visiting their home country or joining in heritage language schools and programs (Rohani et al., 2006).

Children's heritage language activities and practices occur primarily within the home or community before attending a formal educational setting (Park, 2008). In comparison to using heritage language only in the family (as a particular context), language use via community contact, such as business, clubs, and public services (as a sociocultural context), vitally promotes heritage language maintenance (Oriyama, 2012). For instance, the vitality of heritage language groups may be presented in heritage language signs like in businesses, places of worship, clubs, and literature that provides information about community events (Holmes, 2013). After all, within multilingual and/or multicultural societies, heritage languages are more effectively maintained in communities

that place a high value on them (Holmes, 2013) because more resources will be allocated to heritage language retention and maintenance where support for heritage languages is high (Dixon et al., 2012). For example, compared to Chinese immigrants living in the Chinatown areas of big cities, immigrants living outside of those areas are less likely to maintain their heritage language until the third generation of their families after immigration (Holmes, 2013).

Moreover, regular communication with people who use heritage language contributes to maintaining heritage language (Holmes, 2013) since heritage language proficiency can be improved by frequently communicating in that language (Rohani et al., 2006). Although family (or parents) is the primary source of heritage language input for children, familial impact declines as the children grow (Jia et al., 2014). For instance, heritage language communication with parents among Chinese-English and Korean-English bilingual children dropped from 90% to 70% as they grew up (Jia et al., 2014). By extending heritage language relationships beyond the family, children's heritage language acquisition and maintenance are positively impacted by community members, including teachers, peers, teammates, club members, etc., who input the heritage language into the child's life (Zhang et al., 2018). A study of multiple bilingual groups (such as Chinese-English, Spanish-English, and Hebrew-English) indicated a positive correlation between heritage language maintenance, the number of heritage language speakers that bilinguals spoke with, as well as the frequency with which they spoke to these heritage language speakers (Gollan et al., 2014). This study also revealed that interaction with and exposure to a broad range of heritage speakers could enhance heritage language proficiency while not hindering English proficiency (Gollan et al., 2014). Furthermore, Zhang et al. (2018) conducted a bidimensional study to investigate the impact of socialization, in both the family and the community, on the bilingual proficiency of Latino and Asian American young adults, and it was noticed that while family factors were important in promoting heritage languages and English in both groups, community factors were significant in maintaining heritage languages in the Asian community. Therefore, children's heritage language acquisition and maintenance are significantly correlated with their language use and exposure in their families and heritage communities.

Language use and exposure in the domain of heritage language school

While heritage language maintenance relies mainly on family and community play in fostering an environment conducive to language retention (Rohani et al., 2006), heritage language

schools also play an essential role in preserving heritage language and literacy (Fishman, 1991; Kouritzin, 1999). Though immigrant children come to understand their heritage cultures and languages primarily in the home and heritage community (Sam, 2006), their success or failure in maintaining heritage languages also depends on institutional support (Holmes, 2013). In particular, teachers and peers play an increasingly important role than parents in children's language input, especially after the child is older than 30 months (Sun et al., 2020). Due to the crucial impact that educational institutions have on children's heritage language maintenance and development, school-level factors such as heritage language input quality at school is essential to fostering heritage language retention, and this input quality is ultimately related to teacher qualifications such as education level, domain knowledge (or heritage language proficiency), and teaching experience, all of which correspond to classroom quality, and teacher-child interaction quality (Sun et al., 2020). Heritage language quantity at school relates to the amount of instruction in the heritage language (Sun et al., 2020). Additionally, children's heritage language proficiency (such as vocabulary development) is boosted by the amount of time that schools dedicate to book reading and concept building in the heritage language. Interacting with the teacher and other peers in heritage language during and between the classes also enhances heritage language proficiency (Sun et al., 2020).

Based on the linguistic developmental interdependence hypothesis (Cummins, 1991, 2001, 2008), heritage language training (via school/education) facilitates children's literacy acquisition, and communicative fluency in both their heritage and dominant languages enhances their cognitive development and academic performance and promotes their favourable outlook on different ethnocultural backgrounds (Wells, 1981; Swain & Lapkin, 1982; Ramirez, 1985; Danesi, 1991; Chow, 2001; Benson, 2009; Oriyama, 2012; Du, 2017; Ortega, 2020). However, to access heritage language education in Canada, young heritage language learners must turn to non-public education institutions like private schools and community-run language programs or universities if pursuing high-level language classes, due to insufficient institutional support for acquiring and maintaining their heritage languages; for example, British Columbia has diverse immigrant groups, yet their languages are considered as secondary or foreign languages in public school curriculum rather than as heritage languages that contain cultural value (Duff & Li, 2009; Locher-Lo, 2019). Furthermore, the research on, and the pedagogical experience with, heritage language education has made it evident that learning the heritage language formally at schools contributes to positive academic

and sociocultural results (Duff, 2008; Duff & Becker-Zayas, 2017; Montrul, 2018; Nordstrom, 2020).

In a case study of six-year-old Chinese children learning Mandarin as a heritage language in Ontario, Canada, they were taught Mandarin literacy using multimodal communication at school rather than traditional Chinese heritage language teaching (e.g., teacher-centred direct instruction or typical repetitive drills) (Du, 2017). The children were engaged in a multicultural learning environment that exposed them to multiliteracies in English and Mandarin (i.e., involving 'listening, speaking, reading, writing, and viewing') (Du, 2017). The study found that the children's Mandarin learning was highly promoted by the teachers' stimulating and multimodal teaching practices (i.e., applying "gestures, sounds, images, and speech to understand the meaning and structure of Chinese characters", "singing Chinese songs", "making crafts", presenting drama shows", and "translating nursery rhymes") (Du, 2017, p.13). As evening and weekend community schools are limited by time and space, another study was conducted in which heritage language teachers' experiences of digital technology use were explored in two community schools in Alberta, Canada (Palladino & Guardado, 2018). The study interviewed teachers and students regarding their experiences with asynchronous and text-based online tools in heritage language classes. The study showed that students' heritage language learning was primarily enhanced by teachers' use of abundant materials and activities via digital technologies (such as online tasks or presentation programmes) (Palladino & Guardado, 2018). Remarkably, it noted that heritage language learners' reading and writing skills were boosted by accessing unlimited and various learning resources (e.g., via wikis and blogs) beyond the heritage language classroom (Palladino & Guardado, 2018). Above all, to effectively support young Chinese children's heritage language learning and their academic skill development, school- and classroom-level attributes were notably highlighted as follows. The school-level factors involve learning environments that employ leadership styles designed to foster teachers' professional development (Zhang et al., 2019). In contrast, the classroom-level factors include creating learning environments that promote children's individual interaction experiences and interpersonal relationships with teachers and peers (Zhang et al., 2019). In brief, the home, heritage community, and heritage language school all play interrelated roles in children's heritage language maintenance and proficiency.

Language attitudes

Despite the lack of exposure and use of heritage languages in an immigrant child's new society, language maintenance can be achieved by creating heritage language inputs, which requires parents' positive will (Krashen, 1981). Because parents are mainly responsible for transmitting heritage languages to their children (Fishman, 1991), their attitudes towards heritage language directly impact immigrant children's heritage language skills and identity formation (Li, 1999). To a certain extent, parents' attitudes facilitate or inhibit their children's acquisition and maintenance of heritage languages (Rohani et al., 2006). On the one hand, immigrant children tend to maintain a high level of heritage language if their parents promote the language and transmit it to them; on the other hand, they maintain a low level of heritage language if they are urged to shift to English to succeed in mainstream society (Zhang, 2005; Li, 2006; Zhang & Slaughter-Defoe, 2009). A study into the personal and physical experience of raising bilingual children found that children could acquire a command of two languages and become balanced bilinguals when parents made time to teach them heritage languages and helped them feel proud of the language (Caldas & Caron-Caldas, 1992, 2008). This study also noticed that bilingual children had higher scores than monolinguals when evaluating verbal and non-verbal intelligence, such as in 'Houghton Mifflin Reading Program Readiness Test' and 'Speech Screening Test' (Caldas & Caron-Caldas, 1992, 2008). While after reviewing seventeen studies from the year 2000 regarding parental perceptions and practices among immigrant families in America or Canada, Liang (2018) found that parental attitudes towards their children's heritage language maintenance might change and noted that what they practised sometimes did not match what they thought. Though parents took every effort to maintain heritage languages by establishing a home environment in which the heritage language was used and sending their children to heritage language school programs, they still faced challenges in heritage language maintenance like the children shifting languages since they started to attend public educational institutions, their reluctance to attend heritage language schools, and the parents' temporal constraints (Liang, 2018). In turn, heritage language maintenance is best undertaken communally, with educational institutions, governments, and other organizations all working together with parents to help children preserve the language (Liang, 2018).

Last but not least, reversing language shift needs changing resistant attitudes (Fishman, 1991) because a heritage speaker's self-consciousness and esteem in their language and culture play a key role in enhancing their abilities to maintain their heritage language (Bonvillain, 2000;

Bradley & Bradley, 2002). A study of Chinese-Canadians revealed the positive relationship between language learners' attitudes and their heritage language development (Young & Gardner, 1990). Namely, participants with positive attitudes towards heritage language obtained proficient command of the Chinese language and were eager to improve their Chinese language skills (Young & Gardner, 1990). It can, however, be challenging to facilitate children's positive attitudes towards Mandarin language and literacy, and they tend to have a general lack of interest due to insufficient support from mainstream institutions and society, cross-language differences in the writing systems, and an environment not conducive to maintaining Chinese (Caldas & Caron-Caldas, 2000; Liu, 2008; Duff et al., 2017). If children do not understand all the specifics of linguistic environments at an early age, they certainly understand that there are rules about language use. In an examination of 65 elementary school bilingual children, Miller (2017) observed that while the children preferred using English, they did not view other languages negatively, or attach prestige to any one language. However, as early as kindergarten, the children understood that there were differences in when, where, and with whom different languages were supposed to be used. For example, children reported that English was used in the classroom, heritage language at home, and in the playground. Thus, the probability of maintaining heritage language could be increased if more second-generation immigrants were encouraged to become bilingual and bicultural, thought the tendency of language shift could not be entirely suspended (Miller, 2017).

2.4 Research Limitations of Chinese as a Heritage Language in Canada

Research about Chinese as a heritage language and Chinese heritage speakers has been widely discussed in Western countries, such as the U.S. (Zhang, 2010, 2012; He, 2015; Liao et al., 2017; Smith & Li, 2020), Canada (Curdt-Christiansen, 2009; Sun, 2016; Duff et al., 2017; Luo et al., 2018; Duff & Doherty, 2019; Locher-Lo, 2019), Australia (Hu et al., 2014; Mu, 2015), New Zealand (Mu & Dooley, 2015; Li, 2020), and the U.K. (Wei, 1994, 2011; Hua & Wei, 2014, 2016). There are different ways to approach Chinese heritage languages and their speakers depending on sociopolitical and historic contexts. We will present here a brief history of Chinese heritage speakers in Canada.

2.4.1 Definition of Chinese as a heritage language and Chinese heritage speakers in Canada

Chinese is a term that encompasses several different dialects, including Wu, Xiang, Gan, Min, Cantonese, Hakka, and Mandarin (He, 2008). However, Mandarin is considered China's majority standard variety, and it is the main variant taught in Chinese language classrooms (He, 2008). In the Canadian context, the Chinese language, based on Nagy (2018, p.432), is defined as a heritage language that belongs to languages other than Canada's official and Indigenous languages. According to Locher-Lo (2019), the Chinese Heritage Language in Canada refers to any Chinese dialects that a Chinese immigrant family may be familiar with, such as Mandarin, Cantonese, Hakka, and Shanghainese. Though Cantonese was the dominant Chinese dialect spoken in Canada previously, Mandarin is the most spoken Chinese dialect contemporarily since Mandarin has grown in popularity and relevance in China in the last few decades (Locher-Lo, 2019).

Based on Valdés (2000, p.1), Chinese heritage speakers are described in this study as individuals raised in a home where the Chinese language is spoken and who speak or at least understand the Chinese language, making them to some degree bilingual in Chinese and English. According to earlier studies (Wu, 2005; Baolian Qin, 2006; He, 2008), Chinese heritage speakers are rarely viewed as true bilinguals because their Chinese language ability is often limited to essential daily dialogues and only elementary literacy skills. In addition, Chinese heritage speakers are typically characterized by using unconventional and straightforward syntax and mixing Chinese and English (He, 2015).

2.4.2 Research limitations of Mandarin Chinese as a heritage language in Canada

Because of the dramatic growth of international trade with Asia in the last few decades, learning Mandarin has become economically valuable for people worldwide, and Mandarin is increasingly becoming valued in global commerce as a niche language used in business dealings (Locher-Lo, 2019). Hence, governments around the world, including North America, Australia, and the UK, have begun transforming educational mandates in recognition of China's new economic power in the world by promoting Mandarin language education and Asian Studies since fostering Mandarin proficiency and Chinese cultural competence is expected to create a competitive advantage in world markets (Locher-Lo, 2019). Yet, rather than highlighting the cultural identities and ancestral heritage carried within the Chinese language, the Canadian government promotes the Chinese language as it can lead to multilingual and economic opportunities (Locher-Lo, 2019).

Little attention has been paid to the acquisition and maintenance of Chinese as a heritage language, as researchers and scholars are more interested in explaining Chinese immigrant children's academic success by examining their cultural, familial, and communal factors (i.e., Siu, 1992; Chao, 1994, 1996; Lu & Li, 2008; Kondo-Brown, 2010; Lam et al., 2015; Duff et al., 2017).

A relatively limited amount of the studies of Chinese heritage languages could be caused by the fact that a variety of languages spoken by immigrants come from the southeast of China, such as Cantonese, Fujianese, and Hakka, which makes research on variant Chinese language maintenance a complicated task (Zhang, 2005). Compared to Mandarin, Cantonese as a heritage language has been discussed by researchers in Canada more often due to its long history and widespread speakers (i.e., Nagy et al., 2014; Tse, 2016; Lam, 2018; Nagy & Lo, 2019). Besides, this restricted number of studies may be a result of the vast linguistic distance between English and Chinese, such as phonological dissimilarity, "word order typology, and morphological complexity" (Sun et al., 2020, p.820), as these vast differences tend to prevent researchers who are unfamiliar with the Chinese language from undertaking such a venture. In addition, research about Chinese heritage languages in Canada has been mainly conducted in the province of Alberta, British Columbia, or Ontario (i.e., Sun, 2016; Du, 2017; Koh et al., 2017; Pan & Wang, 2017; Locher-Lo, 2019), rather than Saskatchewan, since they have numbers of Chinese heritage language school programs and larger size of Chinese immigrants and communities (Census Canada, 2016).

Instead of discussing Chinese heritage learners (who learn Chinese as a second or foreign language) as most researchers did (i.e., Koda et al., 2008; Kondo-Brown, 2010; Wen, 2011; Xiao & Wong, 2014), this study focuses on Mandarin heritage speakers who have learnt Mandarin as the first language and acquired competence in it mainly through socialization at home, and who may not have attained full-control over it due to switching to the dominant language (Montrul, 2016; Polinsky, 2018). Much Chinese heritage language acquisition research (such as Wong Fillmore, 1991, 2000; Wei, 1994; Jia & Wei, 2008; He, 2015; Mu & Dooley, 2015) has indicated that Chinese heritage speakers eventually experience rapid attrition of the Chinese heritage language when they enter institutions where English is the majority language because it interferes with their ability to maintain Mandarin as a heritage language in an immigrant context. It is nearly likely that their Mandarin language skills will ultimately lag behind those of Mandarin monolinguals in China, owing to their limited exposure to Mandarin outside of the home and any Mandarin literacy programmes they may take (He, 2015). As a result, they have few or no chances to improve their

vocabulary, complex grammar, reading, and writing abilities, which are generally obtained through formal language instruction and literacy training (He, 2015).

It is unknown, however, if children can maintain and fully develop their Mandarin language abilities once they enter public school, as some Chinese heritage speakers may compensate for lack of formal Mandarin language education with alternate ways to language literacy, such as attending Chinese heritage language schools (Koda et al., 2008; Putnam et al., 2018), and an appreciation for their heritage language may take shape if parents continue speaking their language to children well into their final grades of formal educations in English (Miller, 2017). Thus, the impetus of the study is to examine which sociolinguistic parameters covary with the children's Mandarin language proficiency parameters.

2.5 Research Objectives and Research Questions of the Study

To provide an in-depth descriptive study of Mandarin-English bi/multilingual children and their acquisition and maintenance of Mandarin heritage language, the research compared the Mandarin language proficiency and development in bi/multilingual children (who were either born and raised in Canada or born in China and brought to Canada by the age of three) with that of Mandarin monolingual children (who were born and raised in China) across two age groups (ages 5 to 7 and ages 10 to 12). The selection of age groups is motivated by the critical period hypothesis (Lenneberg, 1967), which claims that native language would be lost if the implicit linguistic learning capacity is not triggered during the 'critical' period (by the age of 13 or puberty) in childhood (Montrul, 2016). By age 3 or 4, fundamental vocabulary, phonology, syntax and semantics may already be in place (Montrul, 2016). Around age 5, conversational fluency has been established by the great majority of native speakers of any language (Cummins, 2009). After about age 5, the flexibility of the language procedural memory steadily declines biologically; from about age 7, cognitive reliance on conscious declarative memory grows for general learning and language learning (Nikolov, 2009). The human brain is not fully developed until around the ages 10 to 12, associated with brain plasticity and the process of neuronal myelination throughout development as a cause of the critical period for language development (Montrul, 2016). Even though bilingual children were found parallel and balanced bilingual development until around the age of three or four, their development diverges after ages five to six as the majority language gains the dominance

after they attend public schools which results in slowing down or stagnating their heritage language development (Montrul, 2018). Thus, the research takes age into account as necessarily biological factor in child language acquisition and maintenance, especially the school-age years which are a critical phrase of language development for monolingual and bilingual individuals alike.

In addition, the research will solicit the opinions of the parents about home, school, and other societal efforts that could aid their children in acquiring and maintaining Mandarin Chinese as a heritage language in Canada, and the ideas from the bi/multilingual children in terms of the efficient ways that they prefer to learn Mandarin Chinese as a heritage language at and outside the home.

2.5.1 The detailed objectives of the study

- To compare Mandarin speech proficiency between the bi/multilingual children from Canada and the monolingual children from Mainland China;
- To compare bi/multilingual children's Mandarin speech proficiency across two age groups: children (5 to 7 years old) and young adolescents (10 to 12 years old);
- To describe the attitudes held by the parents and children towards speaking Mandarin and maintaining Mandarin as a heritage language, and to examine the relationships between language attitudes held by the parents and children on the one hand, and children's heritage language speech proficiency on the other hand;
- To identify the language(s) used by the parents and children when they communicate with each other and other family members, as well as with Mandarin speakers from outside, and to access if correlations exist between language use by the parents and children and children's heritage language speech proficiency; and
- To indicate the amount of exposure the children have to Mandarin, English, and other languages in the domains of the family/home, heritage community, and heritage language school, and to investigate whether correlations exist between the children's language exposure and their heritage language speech proficiency.

2.5.2 Research questions

This study seeks to answer the following research questions:

- How does Mandarin language proficiency compare across bi/multilingual and mono-

lingual children in two different age groups?

- What are Mandarin heritage language proficiency and maintenance levels among the children from Chinese-speaking immigrant families in Saskatchewan?
- What are the relationship between the children's Mandarin language proficiency and parents' and children's language attitudes on the one hand and their language use at home and in social domains on the other hand?
- What are the relationship between the children's Mandarin language proficiency and their language exposure at home and in other social domains?

CHAPTER 3
MATERIALS AND METHODS

This chapter presents the methodology and materials used in this study. It begins with research design and is followed by participants' recruitment, data collection instruments and data analyses.

3.1 Research Design

Based on the Variationist Sociolinguistics approach of investigating correlations between social factors and language variables (i.e., Tagliamonte, 2006, 2012; Nagy et al., 2014; Nagy, 2018; Aalberse et al., 2019) and according to the methods that are primarily adopted in bi/multi-lingualism and heritage language maintenance research (i.e., Schwartz & Katzir, 2012; Altman et al., 2018; Govindarajan & Paradis, 2019; Makarova et al., 2019), the research design in the study employed the following methods:

- An assessment of the children's Mandarin speech production, complexity, and fluency by extracting oral language proficiency parameters (narrative/story-telling task);
- A statistical analysis of objective Mandarin speech proficiency parameters across the groups of heritage bi/multilingual children in Canada and monolingual children in China (t-test analysis);
- A questionnaire study of the parents' language use and language attitudes, and their children's language exposure within and outside the home and family;
- An interview study of the heritage bi/multilingual children's language use and language attitudes, and their language exposure within and outside the home and family; and
- A statistical analysis of the parents' and children's responses to the questions about language use, attitudes, and exposure versus children's Mandarin speech proficiency parameters (correlation analysis).

3.2 Participants' Eligibility Criteria

The criteria for selecting bi/multilingual child participants were as follows: they had to be either born in Canada or brought to Canada by the age of three; they had to have at least one parent who was born in China and immigrated to Canada after their adulthood; they could speak Mandarin and English, and they were in the age groups between 5 and 7 years old or 10 and 12 years old. The eligibility criteria for monolingual children were as follows: they were born in China, they could speak Mandarin, and were in one of the same two age groups as the bi/multilingual children from Canada.

3.2.1 Participants' recruitment

The participants in this study were selected by purposeful sampling. The parents and their bi/multilingual children were recruited in Saskatoon, Saskatchewan, initially via various community venues advertisement posts printed in simplified Chinese and English (ref. Appendix A). This recruitment included flyers distributed in the Chinese restaurant (e.g., Go for Sushi Buffet Restaurant) and supermarket (e.g., Super Fresh Asian Market). Announcements were also made in Chinese language schools (e.g., the Heritage Chinese Language School, the Chinese Language School of Saskatoon, and after-school Chinese language program) and Chinese cultural classes (e.g., the Chinese Dance School of Saskatchewan and the Chinese Martial Arts Academy). Advertisements were also posted online via a Saskatoon Chinese website and Saskatoon Chinese online groups (e.g., Wechat via Weixin App). After the initial round of recruitment, the progress continued with "snowball" sampling of the friends and acquaintances of already participating parents.

The monolingual children were recruited from Huangpi Qianchuan No.6 Kindergarten and Elementary School in Wuhan city, Hubei province, China. This location was selected for three reasons. First, Wuhan city is closed to the hometown of the researcher, which allowed her easier recruitment access. Second, the researcher received the permission to conduct the study from the School Principal. Third, Wuhan city is close to the geographic center of China, as Saskatoon is located in the middle of the Canadian prairies. Both Wuhan and Saskatoon are regional centers, but not major metropolises, and the samples are thus comparable by location.

The parent and child participants participated in all the questionnaires, interviews, and

narrative tasks were on a purely voluntary basis.

3.2.2 Ethics approval and participant consent/assent forms

Ethics approval #13-20 was received on January 13th, 2013; and was issued by the Behavioral Research Ethics Board at the University of Saskatchewan. Before participating in the study, the parents were requested to sign the consent forms (ref. Appendix B), and the children were invited to write their names on the assent forms (ref. Appendix C). The researcher explained the content and the purpose of both forms and informed the participants about their rights to anonymity and to withdraw at any point. Communication between the researcher and participants was in Mandarin in China and in the preferred language of participants (Mandarin or English) in Canada. The copies of consent and assent forms were given to every participant.

3.3 Data Collection Instrument and Procedures

The data collection instruments were comprised of:

- A questionnaire for the parents from Chinese immigrant families about their language use, language attitudes, and their children's language exposure;
- An interview with the heritage Mandarin-English bi/multilingual children about their language use, language attitudes, and language exposure; and
- An analysis of the objective Mandarin speech proficiency parameters of the heritage bi/multilingual and monolingual children.

3.3.1 Questionnaire for parents

Questionnaire was employed in this study because it is recognized as a valid instrument for collecting data in sociolinguistic research, particularly in the Variationist Sociolinguistics and in the studies of heritage language maintenance (i.e., Baker, 1994; Crozier, 1999; Rohani et al., 2006; Park & Sarkar, 2007; Kim & Starks, 2010; Lust et al., 2016; Budiyana, 2017; Sun et al., 2018; Kaushanskaya et al., 2020). The questionnaire (ref. Appendix D) in this study was used to explore the background of the children's Mandarin language acquisition and proficiency.

Several questions were designed to examine each parent's language choice and use within and outside the home and family, each parent's language attitudes towards Mandarin-as-heritage-

language maintenance of their children, and their children's language exposure at home, in the heritage language school, and within the greater community of Saskatoon. The questionnaire for parents consisted of about 85 items, which were distributed and grouped into six larger sections with smaller subsections where necessary, and these sections covered the following areas:

- Family demographic backgrounds: about parents (10) and children (5);
- Family language backgrounds: about parents (2), children (1), and other family members (2);
- Language use at and outside the home and family (14);
- Language exposure by children (28);
- Language attitudes held by parents (20); and
- Language practices for maintaining Mandarin as a heritage language (3).

The first section of family demographic background contained questions related to the participant parent's age, gender, occupation, highest level of education completed, place of birth, date of immigration to Canada, and ethnic self-identification. The questions about each participant child's background included the child's age, gender, place of birth, the age of arrival in Canada, as well as their family residence history and frequency of visiting China. These demographic questions have been discussed in the other studies of the bilingual children (i.e., Verhoeven, 1991; Bar-Shalom & Zaretsky, 2008; Hsu, 2014; Montrul, 2020) and were partly adopted from Crozier (1999) and Rahani et al. (2006). This section was made up by close-ended (yes/no and multiple-choice), open-ended, and contingency question (ref. Question 1 to 15 in Appendix D).

The second section of questions about family language background addressed the mother togue and other languages that the parents and their children knew, the English and Mandarin proficiency of the parents, their children, and other family members residing in the family home. As shown in the earlier studies (i.e., Schwartz, 2008; Winsler et al., 2014; Gharibi & Boers, 2019; Tran et al., 2021), the factors covered in the background questions are known to impact language choice and language use. Besides close-ended (yes/no and multiple-choice) and open-ended questions, this section also included matrix questions with a five-point Likert scale for the parents' self-reported assessments of perceived language ability (ref. Questions 16 to 20 in Appendix D). For example, in Question 17, parents were asked to evaluate their "Mandarin proficiency in listening, speaking, reading, and writing" separately with a rating scale "5=native-like, 4=good, 3=moderate, 2=poor, and 1=not at all" (notes: "good: generally handling language well with

occasional inaccuracies; moderate: coping with overall meaning in most situations with some mistakes; and poor: limited language competence with familiar situations only").

The third section of the questionnaire related to language use and was designed to get insights into each parent's language choice in different domains. In particular, this section explored each parent's language use with his or her child, spouse, and other family members who lived in the family home, as well as the parent's language use with friends and acquaintances outside home (e.g., in Chinese churches or during Mandarin-related activities and events). The parameters addressed in these questions have been identified as factors impacting children's heritage language maintenance (i.e., Albirini, 2014; Tao et al., 2015; Tsinivits & Unsworth, 2021). This section was composed of close-ended (yes/no and multiple-choice), contingency, and rating scale questions (ref. Questions 21 to 34 in Appendix D). For example, in Question 28, parents were asked "has your child met his/her grandparent(s) if they live separately?"; and if the response was "yes", then they needed to answer a follow-up question about the frequency of the particular language behavior, i.e., "how often do they meet each other?" with five-point Likert scale "5=almost always, 4=often, 3=sometimes, 2=seldom, 1=never". To identify the language that parents usually used, multiple-choice questions were applied; for instance, in Question 22, parents were asked "what language(s) do you usually speak to your child at home?". In response, they needed to select an answer from the following options: "only Mandarin, mostly Mandarin, both Mandarin and English equally, mostly English, only English, or other language(s) (specify)".

The fourth section of the questionnaire focused on children's language exposure. Parents were asked about their children's exposure to Mandarin media, explicit language instruction and literacy practices in Mandarin at home, in the Mandarin language classes, and in the Mandarin-speaking communities (e.g., Chinese churches, restaurants, or supermarkets). The significance of language exposure at home, school, and within the larger communities has been highlighted in other studies on heritage language maintenance (i.e., Siu, 1992; Rohani et al., 2006; Dixon et al., 2012; Zhang et al., 2018). In this section, in order to ascertain children's language exposure to formal schooling in Mandarin, close-ended (yes/no and multiple-choice), open-ended, and contingency questions were applied (ref. Question 62 in Appendix D). For instance, in Question 62, parents were asked "has your child attended Mandarin language classes?"; and if the answer was "yes", then they were asked to respond to the follow-up question "what is the highest level of Mandarin language class that your child has achieved?" by selecting from the options "pre-school

level, elementary-school level (specify in which grade), or middle-school level (specify in which grade)". In addition, to access the children's Mandarin language exposure at home and within the larger community, matrix questions with rating of the frequency of the behaviour were added (ref. Questions 35 to 61 in Appendix D). For example, in Question 48, parents were asked "how often do you read Chinese storybooks with your child at home?", and a five-point Likert scale consisted of the answers "5=almost always, 4=often, 3=sometimes, 2=seldom, 1=never".

In the fifth section of the questionnaire dealing with language attitudes, parents were given scaled matrix questions to access their attitudes towards their children's Mandarin-as-heritage-language maintenance (ref. Questions 63 to 82 in Appendix D). This section drew on the previous studies of language vitality and language attitudes, such as Oppenheim (2000), Krosnick et al. (2005), Zhang (2009), Budiyana (2017), and Nagy (2018). The participants responded to these questions with ratings of importance of an issue, indicating whether they strongly agree, agree, neutral, disagree or strongly disagree with a statement. For instance, in Question 72, the statement was "it is important that my child can speak Mandarin and English and becomes a bilingual", and the parents answered with a five-point Likert scale "5=very important, 4=important, 3=neutral, 2=not important, 1=not important at all".

The sixth section of language practices part of the questionnaire was made up by three open-ended questions, which were aimed at filling in gaps left by the participants' responses to the statements. Because heritage language maintenance closely relies on personal, community, and government efforts (i.e., Pearson, 2007; Fishman, 2013; Curdt-Christiansen & La Morgia, 2018; Smith & Li, 2020), parents were invited to share their strategies of supporting and facilitating their children's Mandarin heritage language learning and development at home and outside the home (ref. Question 83 and 84 in Appendix D). In addition, the parents were asked to share their perceptions and concerns regarding what measures the institutions and the government in Saskatchewan could provide for enhancing and improving the maintenance of Mandarin-as-heritage-language in the province (ref. Questions 85 in Appendix D). Open-ended questions were employed in this study to gather some qualitative data. This method was selected over other alternatives (such as interviews) due to time constraints on participants families. Eliciting the child interview and narrative alone took over an hour. Thus, the written questionnaire for parents with open-ended questions was selected to enable their free expression of issues related to raising a bi/multilingual child. The responses to those open-ended questions were summarized in the thesis

with the use of key words and phrases.

Prior to distributing the questionnaire, the researcher explained the purposes and nature of the study and obtained informed consent from participating parents. The questionnaire was printed on five letter-sized pages with plain text and no images. The parent participants (only one parent for each child participated) were offered an option to select a questionnaire written in either English (ref. Appendix D) or Chinese version (ref. Appendix E), and all of them chose the Chinese version of the questionnaire. To ensure the equivalency of the questionnaires (and later of interpreting the responses to open-ended questions), the 'back-translation' method (Tyupa, 2011) was used with the participation of four Mandarin-English bilinguals (enrolled in graduate programs in Linguistics).

3.3.2 Interview with children

Interviews have been successfully employed as a research instrument for exploring socio-linguistic factors, such as language use, attitudes, and exposure, and widely used in many studies (e.g., Rohani et al., 2006; Zhang & Slaughter-Defoe, 2009; Brown, 2011; Schwartz & Katzir, 2012; Kung, 2013; Kheirkhah & Cekaite, 2015; Gathercole, 2016; Daskalaki et al., 2019; Wilson, 2021). To acknowledge a self-assessment of Mandarin language acquisition and proficiency, the child participants were asked around 65 interview questions, which included close-ended (yes/no and multiple-choice) and short-answer questions, as well as contingency and rating scale questions.

Yes/no and short-answer questions were used to access the children's language background and language ability. For example, in Question 4, children were asked "can you speak other language(s) (besides English and Mandarin)?". If the response was "yes", then they were asked to answer the follow-up question "what other language(s) do you speak?" As another example, in Question 48c, children were asked "did you have difficulties in speaking Mandarin while visiting China?", and if the answer was "yes", then they were asked to respond to the follow-up question "what kind of difficulties did you have in speaking Mandarin there?". In addition, yes/no questions were asked to establish the children's exposure to Mandarin in the domains of the home, heritage language school, and heritage community. For example, in Question 14, children were asked "did you watch Mandarin TV channels at home?", and in Question 44, children were asked "did you attend Chinese churches?". To gain some evidence of the children's Mandarin language abilities in reading and writing, yes/no questions were asked and their language practices in reading and writing were taken. For instance, in Question 32, children were asked the question "can you read

in Mandarin (provided a sheet of paper printed with the very basic Chinese characters)?". If the response was "yes"; they were provided with two sheets of paper with printed Chinese texts (one named '小小的船/little boat' with PinYin and the other named '雪孩子/Snowman' without the support of PinYin) and invited to pick up the paper(s) that they were able to read in Mandarin. All three examples of reading materials were extracted from a Chinese language textbook offered in grade one at the elementary school in China (ref. Appendix I). In Question 33, children were asked the question "can you write Chinese characters?". If they answered affirmatively, they were provided a pen and a sheet of blank letter-sized paper and asked to write down as many Chinese characters as they could within 90 seconds (ref. Appendix J: selected writing samples collected from the child participants). In Question 63, children were asked the question "did you learn Mandarin at home?", and if the answer was "yes", then they were asked to reply to follow-up questions such as "from whom did you learn Mandarin at home?" and "how did they teach you Mandarin?".

Multiple-choice questions were employed to attain detailed information about the children's language use with family members who resided at home (i.e., mother, father, siblings, and grandparents) and with Mandarin speakers outside the home (i.e., friends, relatives, classmates from Chinese language schools, and Mandarin speakers in the larger Chinese communities such as people in Chinese churches, restaurants, and supermarkets). For instance, in Question 11, children were asked the question "what language(s) do you usually speak to your mother at home?", choosing from four options "Mandarin, English, Mandarin and English equally, or other language(s) (specify which language(s))". Meanwhile, multiple-choice questions were also asked to investigate the children's language attitudes via their language preference response. For example, in Question 52, children were asked to respond to the question "which language(s) do you feel more useful?", selecting from four options "Mandarin, English, both Mandarin and English, or other language(s) (specify which language(s))".

Rating scale questions were adopted to access the children's listening comprehension abilities in Mandarin when other Mandarin speakers (such as parents, siblings, grandparents, relatives, friends, classmates, teachers, and Mandarin speakers from Chinese community) spoke to them, as well as to examine the children's daily language practices (e.g., in Mandarin listening, speaking, reading and writing) and the frequency with which they used Mandarin at and outside the home. For instance, in Question 39e, children were asked the question "how much Mandarin

did you understand when your Mandarin-speaking friends spoke to you?", and a five-point Likert scale offered the answer "5=almost all of them, 4=most of them, 3=half of them, 2=few of them, 1=none of them". In Question 24, children were asked the question "how long did you usually spend practising reading in Mandarin every day?", and the question had a rating scale with the answers "7=a whole day, 6=more than half a day, 5=half a day, 4=fewer than half a day, 3=one or two hours a day, 2=fewer than one hour a day, 1=never". And in Question 9, children were asked the question "how often do you use Mandarin at home every day?" with five-point Likert scale "5=almost always, 4=often, 3=sometimes, 2=seldom, 1=never".

Before starting the interview, the researcher explained the goals of the study and obtained informed assent form from the participating children. The interview was printed on four letter-sized pages and was available in English (ref. Appendix F) and Chinese versions (ref. Appendix G). In the beginning of an interview session, the interview questions were read by the researcher in the language (Mandarin or English) selected by the child participant (only one child from each family participated). The children were also informed that they could use their preferred language (Mandarin or English) to answer the interview questions. Almost all child participants preferred that the researcher used English to conduct the interview, only four participants choosing Mandarin for the interview. If a child had difficulties in understanding a question, the researcher explained the question by using question-related examples. For instance, the researcher described Chinese Spring Festival by using the example of receiving red envelopes and eating dumplings or glutinous rice balls. The interviews were recorded with Zoom H2n Handy Recorder in Wave Sound Format.

3.3.3 Language proficiency assessment

Narrative (storytelling) tasks with picture prompts are commonly chosen to gather speech samples from the children exhibiting varying degrees of language proficiency (i.e., Bar-Shalom & Zaretsky, 2008; Chen & Lei, 2013; Boerma et al., 2016; Boerma & Blom, 2017; Holmes et al., 2019; Sheng et al., 2020) because such tasks closely resemble naturalistic speech acts (Rezzonico et al., 2016). Narrative tasks are popular tools for obtaining bilingual children's speech production due to the convenience in setting them up, their attractiveness to children, and their efficiency in eliciting a complex language output for multiple linguistic features and at multiple levels (i.e., Bedore et al., 2010; Squires et al., 2014; Gagarina et al., 2016; Govindarajan & Paradis, 2019; Hao et al., 2019). So, a wordless-picture set description task was used as a tool of evaluating children's

Mandarin language proficiency. To elicit participant narratives, a set of twelve pictures of '龟兔赛跑/the tortoise and the hare' (ref. Appendix H) was selected, since it is a famous story from Aesop's Fables and well-known among the children from Chinese families. Besides, the story of 'the tortoise and the hare' has been widely adopted in the Chinese language and culture studies, such as Chia (1995), Meng (2008), Jin et al. (2012), and Lijun (2013). The pictures were presented to each child in the original sequence as per webpage, designed by iBigtoy Inc. for children 4 years or older. Almost all the monolingual and bi/multilingual children knew about the story of 'the tortoise and the hare', except only one bi/multilingual child did not hear it before.

In the assessment of young children's spoken language proficiency, "productivity and complexity" are considered two significant indicators, whereas the more means the better (Foster et al., 2000, p.355). The children's linguistic abilities, e.g., "the microstructure of narrative competence" (Rezzonico et al., 2016, p.1), were assessed through the performance of the picture description task. Like in earlier studies (i.e., Wei & Lee, 2001; Jia et al., 2005; Qi, 2010; Hipfner-Boucher et al., 2015; Shivabasappa et al., 2018; Yan, 2020), this research focused on language competence aspects of "measures of productivity (i.e., number of utterances, and number of words), lexical diversity (i.e., number of different types of words), linguistic complexity (i.e., sentence length), and morph-syntactic quality (i.e., grammar errors)" (Rezzonico et al., 2016, p.1). Following earlier studies related to Mandarin Chinese language acquisition and proficiency (i.e., Li & Thompson, 1989; Zhu & Dodd, 2000; Duff & Li, 2002; Hua, 2002; Van den Berg et al., 2006; Lin & Johnson, 2010; Yip & Matthews, 2010; Hao, 2012; Chen & Lei, 2013; Chen & Shirai, 2015; Jia & Paradis, 2015; Yang, 2016; Li et al., 2017; Yang & Fox, 2017; Hao et al., 2019; Mai & Deng, 2019; Wang, 2020; Jia & Paradis, 2020), the specific parameters selected for the description of the children's speech proficiency were as follows: total number of words in the narrative (total vocabulary produced), vocabulary size (total number of different lexical items), number of distinct lexemes (total number of different nouns, verbs, classifiers, grammatical particles, final particles, and phrases), average number of words per utterance (utterance length), average number of words per sentence (sentence length), number of clauses, number of incomplete sentences, number of complete sentences, number of simple sentences, number of complex and compound sentences; speech accuracy split by lexical, grammar, and phonological (tone and segmental) errors, and speech rate (average number of words per total seconds), and speech fluency (average number of pauses per total utterances). In addition, the number of calques was counted as well (i.e., direct

translation from English to Mandarin). We also took record of 'code-switching' and 'code-mixing' which are two typical strategies for bi/multilingual interlocutors (Wardhaugh, 2010).

The children's narratives were audio-recorded with a Zoom H2n Handy Recorder in Wave sound format. To extract proficiency parameters, the children's speech was manually transcribed and analyzed by the researcher. The transcripts were checked by Mandarin native speakers for accuracy. All the parameters were manually entered on Excel 2013 spreadsheets for analysis. For instance, orthographic signs of filled pauses (such as oh, ehh, or um) were tidied up when analyzing lexicogrammar (Read, 2000). Lexical accuracy was judged by appropriate word choice (Isaacs & Trofimovich, 2012). Grammatical complexity was explored by applying advanced syntactic structures (Pan & Paul, 2018), and grammatical accuracy was accessed by the contextually correct use of morphology (Housen et al., 2012). Pronunciation accuracy was subjectively and auditorily examined by the accurate tone and segmental features of child spontaneous speech (Yang, 2009). Speech rate and fluency were investigated via breakdown and speed (Martins et al., 2007).

Finally, bi/multilingual children's ability to write Chinese characters was assessed using the total number of Chinese characters written, the total number of different Chinese characters written, and total number of correct Chinese characters written, which were collected from the Chinese characters that each child wrote down on a blank letter-size paper sheet during the interview. Similar methods to assess children's language acquisition in writing (such as character recognition ability) have been employed in multiple studies (Morrow, 2001; Tse, 2011; Wang et al., 2015; Qian et al., 2015).

3.4 Demographics of Participants

The demographic and language background were derived from the parents' questionnaires and the children's interviews. A total of 180 participants were recruited for this study, including monolingual children (n=60), bi/multilingual children (n=60) and their parents (n=60).

3.4.1 Demographics of the monolingual children

Sixty monolingual children (22 girls, 38 boys) were equally divided into two age groups: ages 5 to 7 (n=30, 15 girls and 15 boys) and ages 10 to 12 (n=30, 7 girls and 23 boys). The details for the age distribution of the monolingual children are represented in Table 3.1. All these children

spoke Mandarin besides Wuhan dialect, and none of them spoke any languages other than Chinese.

Table 3.1

Demographics of the monolingual children

Age/Gender	Age 5	Age 6	Age 7	Age 10	Age 11	Age 12	Total number
Number of girls	5	5	5	3	2	2	22
Number of boys	5	5	5	7	8	8	38
Number in total	10	10	10	10	10	10	60

3.4.2 Demographics of the bi/multilingual children

Similar to the monolingual children, sixty bi/multilingual children (34 girls, 26 boys) were even distributed into age groups of 5 to 7 (n=30, 22 girls and 8 boys) and 10 to 12 (n=30, 12 girls and 18 boys). Table 3.2 provides details of the bi/multilingual participant distribution by age.

Table 3.2

Demographics of the bi/multilingual children

Age/Gender	Age 5	Age 6	Age 7	Age 10	Age 11	Age 12	Total number
Number of girls	4	7	11	8	4	0	34
Number of boys	3	3	2	7	6	5	26
Number in total	7	10	13	15	10	5	60

Thirty-nine of the bi/multilingual children spoke Mandarin and English, and twenty-one also spoke a Chinese dialect. The Chinese dialects spoken by the bi/multilingual children included Yue (Cantonese), which was spoken by eleven children; Wu, by three; Hakka, by one; Min, by one; Hui, by one; Ji-Lu Mandarin (Tianjin dialect), by one; Jiao-Liao Mandarin (Anshan dialect), by one; Zhongyuan Mandarin (Nanyang dialect), by one; and Southwestern Mandarin (Wuhan dialect), by one. The names of the dialects reported above are provided based on Wurm et al. (1987)'s Language Atlas of China.

In terms of speaking a language other than Chinese and English, forty-five of the children were multilinguals who spoke Mandarin Chinese, English, and one additional language, and fifteen were bilinguals who spoke Mandarin Chinese and English only. Of the multilingual subset, forty

children spoke French; three spoke Spanish; one spoke Japanese; and one spoke German.

According to parents' responses, forty-seven bi/multilingual children (29 girls, 18 boys) were born in Canada in provinces including Saskatchewan (n=32, all from Saskatoon); Alberta (n=2, one from Fort McMurray and one from Lethbridge); British Columbia (n=2, one from Vancouver and one from Richmond); Ontario (n=3, one from Toronto, one from Hamilton, and one from North Yorkshire); and Quebec (n=8, all from Montreal). Thirteen children (10 girls, 3 boys) were brought to Canada at the average age of 2.3, and their birthplaces in China were in Guangdong province (n=6, two from Guangzhou, two from Shenzhen, one from Jiangmen, and one from Huizhou); Beijing (as Municipality) (n=3); Shanghai (as Municipality) (n=1); Zhengjiang province (n=1, from Yiwu); Hubei province (n=1, from Xiangning); and Guangxi province (n=1, from Qianzhou).

Among the sixty bi/multilingual children, sixteen had lived in other cities besides Saskatoon in Canada for more than six months. In particular, eight had lived in Ontario (Toronto, Hamilton, and London); three in Alberta (Edmonton, and Calgary); two in British Columbia (Vancouver, and Richmond); two in Quebec (Montreal); and one in Saskatchewan (Regina).

Almost all children (59 out of 60) were brought to visit China with an average frequency of once every 3.08 years. The main reasons for children visiting China were to meet family members (reported by fifty-eight parents), to travel (by twelve), and to learn Mandarin (by two).

In addition, more than half the children (39 out 60) described themselves as "Chinese and Canadian", while fifteen identified themselves as "Chinese" and six as "Canadian".

3.4.3 Demographics of the bi/multilingual children's parents

Sixty parents (57 mothers, 3 fathers) participated in the study. Their age ranged from in their 30's to in their 50's and above as follows: twenty-two were in their 30's (ages 30 to 39); thirty-one in their 40's (ages 40 to 49); and seven were over the age of 50. Their highest education levels were: Secondary (n=6), Post-secondary (n=9), Bachelor (n=28), Master's (n=12), PhD (n=1), and PhD or Post-doctoral (n=4). Most parents (n=39) were working outside the home, whereas seventeen parents indicated their status as looking for a job and four identified themselves as housewives.

All parent participants were born in China and immigrated to Canada in their adulthood. Except for one parent from Penghu County, Taiwan province, all the other parents (fifty-nine)

emigrated from Mainland China (see figure 3.1). Their birthplaces were dispersed among twenty-one provinces and forty-four cities as follows. Participants from Guangdong province (n=8) included six individuals from Guangzhou, one from Taishan, and one from Huizhou. Shandong province (n=6) participants came from the following cities (one participant from each location): Tai'an, Changyi, Qingdao, Shouguang, Weifang, and Yangtai. Hubei province (n=6) was represented by two participants from Wuhan, two from Hong hu, one from Xiannin and one from Xiangfan. There was a total of five participants from Liaoning province, two coming from Dalian, and one participant from each of the following cities: Anshan, Dengta, and Liaoyang. Two of Fujian province participants were from Putian, and one participant came from each of the following cities: Zhangzhou, Changle, and Ningde, with the total number of participants from this province being five. Participants from Guangxi province (n=4) lived in Nanning (n=3) and Qianzhou (n=1). Three participants were former residents of Beijing (as Municipality). Henan province had a total of three participants, one from Anyang, one from Nanyang, and one from Luoyang. Of the Jiangsu province participants (n=3), two came from Nanjing and one came from Suzhou. Zhengjiang Province (n=2) was the home of one participant from Linhai and one from Yiwu. The two of Heilongjiang province participants were both from Harbin. Anhui province (n=2) participants came from Taihu and Hefei. The Sichuan province participants came from Chengdu and one from Yibing. And, finally, a total of eight participants reported the following cities as their former homes (one participant coming from each location): Tianjin (as Municipality), Lingshui (Hinan province), Baoji (Shanxi province), Kunming (Yunnan province), Handan (Hebei province), Xinzhou (Shaanxi province), Huaihua (Hunan province), and Renhuai (Guizhou province).

Figure 3.1 Bi/multilingual children's parents' birthplaces in China

Thirty-eight parents indicated that they had also lived in cities other than their birthplaces in China for over six months. Besides living in Saskatoon in Canada, thirty-five parents reported that they had lived in other Canadian cities for more than six months. Seventeen parents had lived in Ontario (Toronto, Hamilton, London, Waterloo, and Kitchener); eight in Alberta (Edmonton, Calgary, and Fort McMurray); five in Quebec (Montreal); three in British Columbia (Vancouver, and Richmond); one in Manitoba (Winnipeg); and one in Saskatchewan (Regina).

Nineteen parents indicated that Mandarin Chinese was their sole home language during their childhood, while forty-one parents reported speaking other Chinese dialects in addition to Mandarin. For instance, Northern Mandarin (Northeastern, Beijing, Ji-Lu, and Jiao-Liao) was spoken by eleven parents; Southwestern Mandarin (Upper Yangtze) by nine; Yue (Cantonese) by nine; Min (Taiwanese/Fujianese) by four; Jianhuai Mandarin (Lower Yangtze) by three; Wu (Shanghainese) by three; Hakka (Kejia) by one; Gan (Jiangxinese) by one; and Jin (Shanxinese) by one. As for their Chinese dialects' proficiency, 76% of the parents (31 out of 41) indicated that

they had achieved "native" level, whereas 12% of them (5 out of 41) stated achieving a "moderate" level and 12% an "advanced" level of proficiency in a dialect.

The average age of immigration among the parents was 29.7. Thirty-two parents came to Canada between 2001 and 2005, nineteen came between 2006 and 2010, seven came before 2000, and two came after 2010. Most parents (58 out of 60) indicated that they had visited China after immigrating to Canada, and, on average, they visited China every 2.74 years. With the exception of five parents who went on trips to China less frequently than once in four years, 91% of parent participants (53 out of 58) reported visiting China regularly, such as once every three years (22 participants), once every two years (20), once in four years (9), and about once per year (3). The reasons for visiting China, as reported by parents, were mostly for meeting their families and friends (46 out of 58), for traveling (11 out of 58), and for work (only one). Like the children's self-descriptions, more than half the parents (40 out of 60) described themselves as "Chinese and Canadian", "Canadian Chinese" (33 parents), and "Chinese Canadian" (7). Two parents identified themselves as "Canadian" and eighteen as "Chinese".

3.4.4 Demographics of the other family members (living in the same household)

Most of the parents who did not participate in the questionnaire (58 out of 60) also originally emigrated from Mainland China, and the remining two who were Canadian-born Chinese, spoke English as their native language, and were able to speak and understand Mandarin to some extent. Among those fifty-eight non-participating parents, forty-five spoke Mandarin as their first language and thirteen spoke other Chinese dialects, such as Yue (Cantonese) (9), Southwestern Mandarin (2) (Wuhan dialect, n=1, and Szechuan dialect, n=1), Hakka (1), and Wu (1).

Except for two bi/multilingual children who had English-speaking fathers, all the other children (n=58) had Mandarin-speaking fathers. All the children (n=60) had Mandarin-speaking mothers living with them at home. Additionally, most of the bi/multilingual children (46 out of 60) had siblings, and around half of them (27 out of 60) lived at home together with grandparents. None of those grandparents spoke English, but most of them (16 out of 27) spoke Mandarin as their first language and some (11 out of 27) spoke other Chinese dialects, such as Northern Mandarin (Shangdong dialect, n=3), Yue (Cantonese, n=3), Hakka (n=1), Min (n=1), Southwestern Mandarin (Szechwan dialect, n=1), Jianghuai Mandarin (Anhui dialect, n=1), and Zhongyuan Mandarin (Henan dialect, n=1).

3.4.5 Family members' language abilities in Mandarin Chinese and English

Most parents reported that they and their spouses have "native-like" proficiency when it comes to Mandarin listening, speaking, reading, and writing, but described themselves and their spouses as having either "moderate" or "good" proficiency with English (see table 3.3 and table 3.4).

Table 3.3

Parents' and their spouses' Mandarin language proficiency

(as reported by the parents)

Parents and their spouses' Mandarin language proficiency/parent responses	Native-like	Good	Moderate	Poor	Not at all	Total
My Mandarin listening is	48	12	0	0	0	60
My spouse's Mandarin listening is	46	10	2	1	1	60
My Mandarin speaking is	44	12	4	0	0	60
My spouse's Mandarin speaking is	40	11	7	0	2	60
My Mandarin reading is	45	14	1	0	0	60
My spouse's Mandarin reading is	43	10	4	1	2	60
My Chinese writing is	42	15	3	0	0	60
My spouse's Chinese writing is	42	12	4	0	2	60

Table 3.4

Parents' and their spouses' English language proficiency

(as reported by the parents)

Parents and their spouses' English language proficiency/parent responses	Native-like	Good	Moderate	Poor	Not at all	Total
My English listening is	5	24	27	4	0	60
My spouse's English listening is	15	27	16	1	1	60
My English speaking is	2	20	33	5	0	60
My spouse's English speaking is	12	27	19	1	1	60
My English reading is	3	26	26	4	1	60

My spouse's English reading is	15	26	17	1	1	60
My English writing is	2	15	37	4	2	60
My spouse's English writing is	14	21	22	2	1	60

In terms of Mandarin and English language abilities of grandparents, based on the parents' reports, most of the grandparents had "native-like" proficiency with regards to Mandarin speaking, listening, reading, and writing, whereas their English language proficiency was mostly zero ("not at all") (see table 3.5 and table 3.6).

Table 3.5

Grandparents' Mandarin language proficiency

(as reported by the parents)

Grandparents' Mandarin language proficiency	Native-like	Good	Moderate	Poor	Not at all	Total
His/her Mandarin listening is	19	4	4	0	0	27
His/her Mandarin speaking is	16	5	6	0	0	27
His/her Mandarin reading is	18	7	2	0	0	27
His/her Chinese writing is	16	10	1	0	0	27

Table 3.6

Grandparents' English language proficiency

(as reported by the parents)

Grandparents' English language proficiency	Native-like	Good	Moderate	Poor	Not at all	Total
His/her English listening is	0	1	0	5	21	27
His/her English speaking is	0	1	1	4	21	27
His/her English reading is	0	1	1	4	21	27
His/her English writing is	0	1	1	4	21	27

When it came to the parents' accounts of their children's Mandarin and English language abilities, most described their children as having "native-like" proficiency with regards to English

speaking, listening, reading, and writing, whereas their description of their children's Mandarin language proficiency ranged from "good" to "poor" (see table 3.7 and table 3.8). In general, it appeared that the children's English language proficiency was better overall than their Mandarin language proficiency.

Table 3.7

Bi/multilingual children's Mandarin language proficiency

(as reported by the parents)

Bi/multilingual children's Mandarin language proficiency	Native-like	Good	Moderate	Poor	Not at all	Total
His/her Mandarin listening is	13	33	13	1	0	60
His/her Mandarin speaking is	8	2	22	4	0	60
His/her Mandarin reading is	2	4	20	25	9	60
His/her Chinese writing is	2	2	14	31	11	60

Table 3.8

Bi/multilingual children's English language proficiency

(as reported by the parents)

Bi/multilingual children's English language proficiency	Native-like	Good	Moderate	Poor	Not at all	Total
His/her English listening is	39	17	3	1	0	60
His/her English speaking is	37	19	2	2	0	60
His/her English reading is	31	11	11	4	3	60
His/her English writing is	25	15	11	6	3	60

3.5 Data Analysis

The sociolinguistic data from the parents' questionnaires and the children's interviews (such as yes/no and multiple-choice answers) were entered into Excel 2013 by numeric coding, e.g., the coding of the 'language use' section of the parent questionnaire was "5=only Mandarin, 4=mostly Mandarin, 3=both Mandrin and English or other Chinese dialects, 2=mostly English, and 1=only

English", and '3=Mandarin, 2=both Mandarin and English equally, and 1=English or other Chinese dialects" for the 'language use' part of the child interview. Speech proficiency parameters (such as number of words, number of different lexical items, average number of words per utterance, etc.) were entered in their absolute values.

To examine the level of Mandarin speech proficiency by the heritage Mandarin-English bi/multilingual children, t-tests (2-tail, unequal distribution) were conducted for each proficiency parameter variance between the heritage bi/multilinguals and Mandarin monolinguals from and across ages 5 to 7 and ages 10 to 12 separately. Since age is known to affect linguistic proficiency among children (Bonvillain, 2000; Bassler, 2004), we compared the proficiency parameters across the younger and the older monolingual and bi/multilingual groups with the help of t-tests (2-tail, unequal distribution). The application of t-test analysis has been largely adopted for accessing language performance, e.g., Johnson & Wilson (2002), Hayati & Fattahzadeh (2006), Ibrahimzadeh et al. (2013), Lin & Johnson (2016), Makarova & Terekhova (2017), Yao & Chen (2017), Giguere & Hoff (2020), and Armon-Lotem et al. (2021). Besides, two-way ANOVA analysis of age and gender factors was also undertaken, though earlier studies (i.e., Allman, 2005; Tuncer, 2009) have already noted that gender was proven to have a less significant role on children's language performance as compared with age.

Furthermore, all the parameters of interest were correlated with each other in order to identify covariances for further investigations, as the intention of this study was not to assume a pre-existing relationship between any parameters. Moreover, previous research suggests utilizing correlations between various parameters related to heritage language development, e.g., Kupisch and Rothman (2018) indicate that there is a need of "making HS (heritage speaker) research more ecologically valid", via "getting fine-grained background information" and "running correlations with input factors", since such analysis could help "describe HS differences towards actual explanation of how and why differences emerge without resorting to backward assumptions regarding the path of development based solely on endstate experimental data" (p. 579). Thus, to explore the relationships between the sociolinguistic variables (i.e., the language use and language attitudes of the parents and children and the children's language exposure within and outside the home and family) on the one hand and all individual speech proficiency parameters on the other hand, bivariate correlation analyses (calculating Pearson Product-moment correlation coefficient) were conducted, a method commonly employed for exploring correlations between social factors

and language variables, e.g., Park et al. (2012), Albirini (2014), Gollan et al. (2014), Jee (2018), Chen et al. (2018), Makarova et al. (2019), Saito et al. (2019), Chung et al. (2019), Hao et al. (2019), Hui et al. (2020), Huang et al. (2020), Tran et al. (2021), and Jenkins & Anderson (2021).

All the statistical analyses were conducted via IBM SPSS 28.

CHAPTER 4
RESULTS

This chapter presents the findings on Mandarin language proficiency among bi/multilingual children and describes the participants' sociolinguistic parameters, i.e., demographic backgrounds, language attitudes and language use by parents and children, and the children's linguacultural exposure as well as language practices. Additionally, the correlations between these sociolinguistic parameters and the children's language proficiency parameters were reported.

4.1 Bi/multilingual Children's Mandarin Chinese Language Proficiency

This section reported the children's objective parameters of Mandarin speech proficiency obtained with the help of a narrative task. The bi/multilingual children's objective Mandarin speech proficiency parameters were compared to those of the monolinguals from China. In addition, this section presented the parents' reports about their children's Mandarin speech proficiency (such as their answers to the questions about how often their children respond to them in Mandarin when they speak Mandarin to them and how well they can understand their children's Mandarin speech), and it displayed the children's self-estimates of their Mandarin linguistic abilities when it came to speaking (the language they believe they speak better and their frequency of speaking Mandarin at home and outside the home), writing (the number of Chinese characters they can write), reading (whether they can read in Mandarin with or without Pin Yin), and listening comprehension (how much Mandarin they can understand when it is spoken to them).

4.1.1 Children's objective Mandarin speech proficiency parameters (as identified by the researcher from children's speech samples)

The children's objective Mandarin speech proficiency parameters were extracted from speech samples obtained with a narrative task. There were twenty-five objective speech proficiency parameters in total: the total number of Chinese words, the total number of different Chinese lexical

items (such as different nouns, verbs, classifiers, final particles, grammatical particles, and phrases), the total number of Chinese clauses, utterances, and complete sentences (including simple sentences and complex and compound sentences), as well as incomplete sentences, utterance length (average number of words per utterance), sentence length (average number of words per sentence), the total number of errors (including phonological errors split by tone and segmental errors, lexical errors, and grammatical errors); speech rate (average number of words per second); and speech fluency (average number of pauses per utterance). All the objective Mandarin speech proficiency parameters of the bi/multilingual children and the monolingual children in the respective gender and age groups (ages 5 to 7 and ages 10 to 12) were compared to one another.

Gender and Age: across each proficiency parameter variance of the bi/multilingual and monolingual children

The factors of gender and age in children's language performance were analyzed and presented in table 4.1.

Table 4.1

Gender and age

(across each proficiency parameter of the bi/multilingual and monolingual children)

Mandarin speech proficiency parameters	Gender					
Participants (n=120, 60 bi/multilinguals & 60 monolinguals)	Boys (n=59)		Girls (n=61)		F value	*P* value
	Mean	SD	Mean	SD		
No. of words	190.71	83.46	183.43	85.55	0.30	0.59
Vocabulary size (no. of different lexemes)	69.90	28.83	66.03	24.82	0.83	0.37
No. of different nouns	*11.14*	*5.74*	*9.03*	*4.95*	*5.03*	*<0.05*
No. of different verbs	*17.37*	*8.91*	*13.53*	*5.20*	*9.39*	*<0.01*
No. of different classifiers	1.15	0.87	1.10	1.09	0.10	0.76
No. of different grammatical particles	2.90	1.49	2.43	1.52	3.18	0.08

No. of different final particles	1.49	0.88	1.69	1.10	1.19	0.28
No. of phrases	*0.59*	*1.21*	*0.23*	*0.64*	*4.51*	*<0.05*
No. of clauses	1.05	1.18	0.85	1.25	0.89	0.35
No. of sentences	11.42	3.82	11.75	4.17	0.22	0.64
No. of simple sentences	*6.27*	*3.72*	*8.15*	*4.89*	*5.57*	*<0.05*
No. of complex and compound sentences	*4.98*	*3.76*	*3.61*	*2.61*	*5.63*	*<0.05*
No. of incomplete sentences	1.93	4.09	1.08	1.37	2.35	0.13
Sentence length (average no. of words per sentence)	16.99	6.13	15.83	5.10	1.45	0.23
No. of utterances	*35.66*	*19.07*	*29.97*	*15.35*	*4.02*	*<0.05*
No. of different utterances	*30.97*	*15.26*	*26.38*	*12.95*	*4.14*	*<0.05*
Utterance length (average no. of words per utterance)	*5.70*	*1.50*	*6.44*	*1.57*	*7.01*	*<0.01*
No. of errors	4	3.90	4.12	2.93	0.03	0.85
No. of phonological errors	0.81	2.19	0.57	0.94	0.63	0.43
No. of tone errors	0.14	0.60	0.15	0.57	0.01	0.91
No. of segmental errors	0.68	2.02	0.43	0.74	0.84	0.36
No. of lexical errors	1.75	2.40	1.95	2.06	0.25	0.62
No. of grammatical errors	1.44	1.43	1.59	1.47	0.32	0.57
Speech rate (average no. of words per second)	2.24	0.94	2.24	0.72	<0.001	0.99
Speech fluency (average no. of pauses per utterance)	0.22	0.24	0.18	0.19	1.03	0.31
Mandarin speech proficiency parameters	Age					
Participants (n=120, 60	Ages 5-7 (n=54)		Ages 10-12 (n=66)		F value	*P* value

bi/multilinguals & 60 monolinguals)	Mean	SD	Mean	SD		
No. of words	*140.43*	*51.54*	*225.12*	*86.91*	*39.40*	*<0.001*
Vocabulary size (no. of different lexemes)	*52.85*	*15.17*	*80.27*	*28.03*	*40.47*	*<0.001*
No. of different nouns	*8.17*	*3.55*	*11.62*	*6.19*	*11.32*	*<0.01*
No. of different verbs	*12.48*	*3.07*	*17.82*	*9.05*	*14.48*	*<0.001*
No. of different classifiers	*0.82*	*0.62*	*1.38*	*1.15*	*10.40*	*<0.01*
No. of different grammatical particles	*2.15*	*1.04*	*3.08*	*1.72*	*10.58*	*<0.01*
No. of different final particles	1.43	0.82	1.73	1.12	3.42	0.07
No. of phrases	*0.13*	*0.39*	*0.64*	*1.22*	*7.04*	*<0.01*
No. of clauses	*0.5*	*0.69*	*1.32*	*1.42*	*14.35*	*<0.001*
No. of sentences	*10.41*	*3.62*	*12.56*	*4.03*	*9.94*	*<0.01*
No. of simple sentences	6.93	3.98	7.47	4.80	1.11	0.29
No. of complex and compound sentences	*3.48*	*2.82*	*4.94*	*3.51*	*4.69*	*<0.05*
No. of incomplete sentences	1.5	2.76	1.5	3.28	0.06	0.81
Sentence length (average no. of words per sentence)	*14.13*	*4.73*	*18.26*	*5.67*	*17.03*	*<0.001*
No. of utterances	*23.98*	*10.39*	*39.96*	*18.76*	*28.69*	*<0.001*
No. of different utterances	*20.70*	*8.15*	*35.12*	*14.94*	*37.48*	*<0.001*
Utterance length (average no. of words per utterance)	6.18	1.55	6.00	1.60	0.06	0.81
No. of errors	3.43	3.63	4.58	3.18	3.58	0.06
No. of phonological errors	0.37	0.76	0.96	2.12	3.30	0.07
No. of tone errors	0.07	0.54	0.20	0.61	1.38	0.24
No. of segmental errors	0.30	0.57	0.76	1.95	2.40	0.12

No. of lexical errors	1.65	2.70	2.02	1.76	0.97	0.33
No. of grammatical errors	1.41	1.47	1.61	1.42	0.71	0.40
Speech rate (average no. of words per second)	*1.92*	*0.63*	*2.51*	*0.88*	*17.57*	*<0.001*
Speech fluency (average no. of pauses per utterance)	0.19	0.22	0.20	0.22	0.08	0.78

Note: a. No./no. is the abbreviation for Number/number.

b. Parameters with significant differences (P<0.05) across two groups were marked in italics.

Comparing the factors of age and gender, age appeared playing a much more significant role than gender in children's language performance. In the following subsections, the objective speech proficiency parameters of the bi/multilingual and monolingual children were examined by the age group.

Bi/multilingual versus Monolingual children: proficiency parameters variance by age

The impact of the age factor on children's language proficiency was checked by comparing bi/multilingual and monolingual children across the two age groups (5 to 7 and 10 to 12). We also compared proficiencies within each major group (bio/multilingual and monolingual) by age.

Bi/multilingual versus Monolingual children: across the two age groups (ages 5 to 7 and ages 10 to 12).

To understand the overall differences between the bi/multilingual and monolingual children, twenty-five objective Mandarin speech proficiency parameters for all the children of both age groups were compared, as described in table 4.2.

Table 4.2

Comparison between all of the bi/multilingual and monolingual children (ages 5 to 7 and ages 10 to 12)

Mandarin speech proficiency parameters	All bi/multilingual children		All monolingual children		(2 tail t-test, unequal)
	Average	Range	Average	Range	*P* value
No. of words	173.48	(40-363)	200.53	(76-454)	0.08
Vocabulary size (no. of different lexemes)	*60.12*	*(15-129)*	*75.75*	*(33-145)*	*<0.01*
No. of different nouns	*6.68*	*(2-18)*	*13.45*	*(5-22)*	*<0.001*
No. of different verbs	*12.78*	*(4-61)*	*18.05*	*(10-36)*	*<0.001*
No. of different classifiers	1.03	(0-3)	1.22	(0-8)	0.31
No. of different grammatical particles	*2*	*(0-5)*	*3.32*	*(1-9)*	*<0.001*
No. of different final particles	1.57	(0-5)	1.62	(0-7)	0.79
No. of phrases	*0.17*	*(0-2)*	*0.65*	*(0-6)*	*<0.01*
No. of clauses	0.78	(0-7)	1.1	(0-5)	0.15
No. of sentences	12.07	(3-26)	11.12	(6-18)	0.19
No. of simple sentences	*8.93*	*(1-22)*	*5.52*	*(0-14)*	*<0.001*
No. of complex and compound sentences	*3.13*	*(0-18)*	*5.43*	*(1-16)*	*<0.001*
No. of incomplete sentences	*2.53*	*(0-22)*	*0.47*	*(0-5)*	*<0.01*
Sentence length (average no. of words per sentence)	*14.98*	*(5.22-32)*	*17.82*	*(7-30.42)*	*<0.01*
No. of utterances	31.05	(7-98)	34.48	(9-82)	0.28
No. of different utterances	27.53	(7-74)	29.73	(9-72)	0.40
Utterance length (average no. of words per utterance)	6	(1.99-10.17)	6.16	(3.28-11.22)	0.58
No. of errors	*5.32*	*(1-23)*	*2.8*	*(0-8)*	*<0.001*
No. of phonological errors	0.8	(0-16)	0.58	(0-3)	0.48

No. of tone errors	*0.28*	*(0-4)*	*0*	*(0-0)*	*<0.01*
No. of segmental errors	0.52	(0-15)	0.58	(0-3)	0.81
No. of lexical errors	*2.47*	*(0-16)*	*1.23*	*(0-5)*	*<0.01*
No. of grammatical errors	*2.05*	*(0-7)*	*0.98*	*(0-4)*	*<0.001*
Speech rate (average no. of words per second)	*2.03*	*(0.17-4.10)*	*2.45*	*(1.03-4.27)*	*<0.01*
Speech fluency (average no. of pauses per utterance)	*0.24*	*(0-1.09)*	*0.15*	*(0-0.92)*	*<0.05*

Note: a. No./no. is the abbreviation for Number/number.

b. Parameters with significant differences (P<0.05) across two groups were marked in italics.

The results showed that fifteen (out of twenty-five) objective Mandarin speech proficiency parameters were significantly different between the bi/multilingual and monolingual children. As expected, monolinguals had a larger vocabulary size than bi/multilinguals, i.e., more and different nouns, verbs, and grammatical particles as well as phrases. It was not surprising that the bi/multilinguals who had no formal schooling in Mandarin, produced more simple sentences and used more incomplete sentences as compared to the monolingual peers who produced longer and more complex sentences. As expected, the monolinguals attained higher speech rate, speech fluency, and overall made fewer errors (such as tone, lexical, grammatical errors) than the bi/multilinguals.

Bi/multilingual versus Monolingual children: within the younger group (ages 5 to 7)

To understand the differences between bi/multilingual and monolingual children at a young age, twenty-five objective Mandarin speech proficiency parameters were compared in children ages 5 to 7, as listed in table 4.3.

Table 4.3

Comparison between the bi/multilingual and monolingual children (ages 5 to 7)

Mandarin speech proficiency parameters	Bi/multilingual children (ages 5-7)		Monolingual children (ages 5-7)		(2 tail t-test, unequal)
	Average	Range	Average	Range	*P* value
No. of words	*155.77*	*(47-333)*	*127.7*	*(76-184)*	*<0.05*
Vocabulary size (no. of different lexemes)	54.87	(15-109)	51.23	(33-76)	0.34
No. of different nouns	*5.93*	*(2-17)*	*9.8*	*(5-17)*	*<0.001*
No. of different verbs	*10.93*	*(4-19)*	*13.3*	*(10-19)*	*<0.01*
No. of different classifiers	0.97	(0-2)	0.7	(0-2)	0.08
No. of different grammatical particles	1.83	(0-4)	2.33	(1-4)	0.06
No. of different final particles	*1.67*	*(0-4)*	*1.23*	*(0-3)*	*<0.05*
No. of phrases	0.2	(0-2)	0.03	(0-1)	0.09
No. of clauses	0.6	(0-3)	0.4	(0-2)	0.27
No. of sentences	11.1	(3-23)	9.6	(6-15)	0.11
No. of simple sentences	*8.33*	*(1-21)*	*5.57*	*(1-12)*	*<0.01*
No. of complex and compound sentences	2.77	(0-18)	4.03	(1-7)	0.07
No. of incomplete sentences	*2.47*	*(0-18)*	*0.5*	*(0-4)*	*<0.01*
Sentence length (average no. of words per sentence)	15	(5.22-32)	13.70	(7-21.29)	0.28
No. of utterances	*27.9*	*(11-56)*	*20.93*	*(9-37)*	*<0.05*
No. of different utterances	*24.5*	*(9-47)*	*17.8*	*(9-27)*	*<0.01*
Utterance length (average no. of words per utterance)	5.85	(3.34-9.88)	6.45	(3.28-11.22)	0.14
No. of errors	*5.9*	*(1-23)*	*2*	*(0-5)*	*<0.001*
No. of phonological errors	1.03	(0-16)	0.43	(0-2)	0.30

No. of tone errors	0.3	(0-4)	0	(0-0-	0.08
No. of segmental errors	0.73	(0-15)	0.43	(0-2)	0.57
No. of lexical errors	*2.83*	*(0-16)*	*0.77*	*(0-3)*	*<0.01*
No. of grammatical errors	*2.03*	*(0-7)*	*0.8*	*(0-3)*	*<0.01*
Speech rate (average no. of words per second)	1.83	(0.33-3.02)	1.98	(1.04-3.62)	0.33
Speech fluency (average no. of pauses per utterance)	0.23	(0-1)	0.16	(0-0.92)	0.21

Note: a. No./no. is the abbreviation for Number/number.

b. Parameters with significant differences (P<0.05) across two groups were marked in italics.

The results of a comparison of Mandarin proficiency across all the bi/multilingual and monolingual children between 5 and 7 showed that eleven (out of twenty-five) objective Mandarin speech proficiency parameters were significantly different. In comparison to the monolingual children, the bi/multilingual children used more words (especially more different final particles) and produced more varied types of utterances when describing the story. However, they used more simple sentences and incomplete sentences in comparison to their monolingual peers. On the whole, the linguistic development of the bi/multilinguals and monolinguals at this young age looked similar except that the monolinguals knew more different nouns and verbs and made fewer errors (especially fewer lexical and grammatical errors).

Bi/multilingual versus Monolingual children: within the older group (ages 10 to 12)

To see whether bi/multilinguals differ from the monolinguals at an older age, twenty-five objective Mandarin speech proficiency parameters were compared in children ages 10 to 12, as presented in table 4.4.

Table 4.4

Comparison between the bi/multilingual and monolingual children (ages 10 to 12)

Mandarin speech proficiency parameters	Bi/multilingual children (ages 10-12)		Monolingual children (ages 10-12)		(2 tail t-test, unequal)
	Average	Range	Average	Range	*P* value
No. of words	*191.2*	*(40-363)*	*273.37*	*(173-454)*	*<0.001*
Vocabulary size (no. of different lexemes)	*65.37*	*(20-129)*	*100.27*	*(70-145)*	*<0.001*
No. of different nouns	*7.43*	*(2-18)*	*17.1*	*(10-22)*	*<0.001*
No. of different verbs	*14.63*	*(5-61)*	*22.8*	*(15-36)*	*<0.001*
No. of different classifiers	*1.1*	*(0-3)*	*1.73*	*(0-8)*	*<0.05*
No. of different grammatical particles	*2.17*	*(0-5)*	*4.3*	*(1-9)*	*<0.001*
No. of different final particles	1.47	(0-5)	2	(1-7)	0.08
No. of phrases	*0.13*	*(0-2)*	*1.27*	*(0-6)*	*<0.001*
No. of clauses	*0.97*	*(0-7)*	*1.8*	*(0-5)*	*<0.05*
No. of sentences	13.03	(4-26)	12.63	(7-18)	0.70
No. of simple sentences	*9.53*	*(1-22)*	*5.47*	*(0-14)*	*<0.01*
No. of complex and compound sentences	*3.5*	*(0-9)*	*6.83*	*(2-16)*	*<0.001*
No. of incomplete sentences	*2.6*	*(0-22)*	*0.43*	*(0-5)*	*<0.05*
Sentence length (average no. of words per sentence)	*14.97*	*(5.4-22.83)*	*21.94*	*(15.61-30.42)*	*<0.001*
No. of utterances	*34.2*	*(7-98)*	*48.03*	*(23-82)*	*<0.01*
No. of different utterances	*30.57*	*(7-74)*	*41.67*	*(22-72)*	*<0.01*
Utterance length (average no. of words per utterance)	6.14	(1.99-10.17)	5.87	(3.80-7.06)	0.51
No. of errors	4.73	(1-10)	3.6	(1-8)	0.07

No. of phonological errors	0.57	(0-3)	0.73	(0-3)	0.47
No. of tone errors	*0.27*	*(0-3)*	*0*	*(0-0)*	*<0.05*
No. of segmental errors	*0.3*	*(0-2)*	*0.73*	*(0-3)*	*<0.05*
No. of lexical errors	2.1	(0-5)	1.7	(0-5)	0.31
No. of grammatical errors	*2.07*	*(0-6)*	*1.17*	*(0-4)*	*<0.05*
Speech rate (average no. of words per second)	*2.24*	*(0.17-4.10)*	*2.92*	*(1.40-4.27)*	*<0.05*
Speech fluency (average no. of pauses per utterance)	*0.26*	*(0-1.09)*	*0.14*	*(0-0.53)*	*<0.05*

Note: a. No./no. is the abbreviation for Number/number.

b. Parameters with significant differences (P<0.05) across two groups were marked in italics.

The comparison of the bi/multilingual and monolingual children ages 10 to 12 showed that nineteen (out of twenty-five) objective Mandarin speech proficiency parameters significantly differed. Without doubt, the older monolingual children demonstrated a better developed linguistic proficiency than the bi/multilinguals due to the monolinguals' higher exposure to Mandarin while learning it formally at school in China. The results demonstrated that the monolingual children ages 10 to 12 produced more words and obtained a larger vocabulary size (such as more different nouns, verbs, classifiers, grammatical particles, and phrases) than the bi/multilinguals. In contrast to the bi/multilinguals who spoke more simple sentences and incomplete sentences, the monolingual children produced a larger variety of utterances and used more clauses and longer sentences such as complex and compound sentences. In addition, the bi/multilingual children made more tone errors than the monolinguals. At the same time, the bi/multilinguals made fewer segmental errors than the monolinguals (probably because the monolinguals' pronunciation may have been affected by their Hubei (Wuhan) dialect). Without exception, the monolingual children commanded higher speech rate and speech fluency than the bi/multilinguals.

Monolingual children at ages 5 to 7 versus those at ages 10 to 12

To understand the differences of Mandarin speech proficiency in monolinguals at younger and older ages, twenty-five objective Mandarin speech proficiency parameters were compared among monolinguals ages 5 to 7 and ages 10 to 12, as shown in table 4.5.

Table 4.5

Comparison of the monolingual children

(ages 5 to 7 versus ages 10 to 12)

Mandarin speech proficiency parameters	Monolingual children (ages 5-7)		Monolingual children (ages 10-12)		Difference significant (2 tail t-test, unequal)
	Average	Range	Average	Range	*P* value
No. of words	*127.7*	*(76-184)*	*273.37*	*(173-454)*	*<0.001*
Vocabulary size (no. of different lexemes)	*51.23*	*(33-76)*	*100.27*	*(70-145)*	*<0.001*
No. of different nouns	*9.8*	*(5-17)*	*17.1*	*(10-22)*	*<0.001*
No. of different verbs	*13.3*	*(10-19)*	*22.8*	*(15-36)*	*<0.001*
No. of different classifiers	*0.7*	*(0-2)*	*1.73*	*(0-8)*	*<0.01*
No. of different grammatical particles	*2.33*	*(1-4)*	*4.3*	*(1-9)*	*<0.001*
No. of different final particles	*1.23*	*(0-3)*	*2*	*(1-7)*	*<0.01*
No. of phrases	*0.03*	*(0-1)*	*1.27*	*(0-6)*	*<0.001*
No. of clauses	*0.4*	*(0-2)*	*1.8*	*(0-5)*	*<0.001*
No. of sentences	*9.6*	*(6-15)*	*12.63*	*(7-18)*	*<0.001*
No. of simple sentences	5.57	(1-12)	5.47	(0-14)	0.9
No. of complex and compound sentences	*4.03*	*(1-7)*	*6.83*	*(2-16)*	*<0.001*
No. of incomplete sentences	0.5	(0-4)	0.43	(0-5)	0.8
Sentence length (average no. of words per sentence)	*13.70*	*(7-21.29)*	*21.94*	*(15.61-30.42)*	*<0.001*
No. of utterances	*20.93*	*(9-37)*	*48.03*	*(28-82)*	*<0.001*
No. of different utterances	*17.8*	*(9-27)*	*41.67*	*(22-72)*	*<0.001*
Utterance length (average no.	6.45	(3.28-	5.87	(3.79-	0.09

of words per utterance)		11.22)		7.06)	
No. of errors	*2*	*(0-5)*	*3.6*	*(1-8)*	*<0.01*
No. of phonological errors	0.43	(0-2)	0.73	(0-3)	0.13
No. of tone errors	0	(0-0)	0	(0-0)	1
No. of segmental errors	0.43	(0-2)	0.73	(0-3)	0.13
No. of lexical errors	*0.77*	*(0-3)*	*1.7*	*(0-5)*	*<0.01*
No. of grammatical errors	0.8	(0-3)	1.17	(0-4)	0.14
Speech rate (average no. of words per second)	*1.98*	*(1.04-3.62)*	*2.92*	*(1.40-4.27)*	*<0.001*
Speech fluency (average no. of pauses per utterance)	0.16	(0-0.92)	0.14	(0-0.53)	0.67

Note: a. No./no. is the abbreviation for Number/number.

b. Parameters with significant differences (P<0.05) across two groups were marked in italics.

A comparison of the younger and older monolingual children's objective Mandarin speech proficiency parameters presented that seventeen (out of twenty-five) proficiency parameters significantly differed across the two age groups. Undoubtedly, the monolingual children from the older group used a larger number of words and more varied lexical items (such as more and different nouns, verbs, classifiers, grammatical and final particles, as well as phrases) than their younger peers. In addition, the monolinguals in the older age group produced more long sentences and diverse utterances by applying more clauses and complex and compound sentences. As seen, the monolinguals from ages 10 to 12 group achieved higher speech rates than their younger peers, but they overall made more errors and especially more lexical errors than their younger peers, probably due to an increase in the number and complexity of their utterances as their age grew.

Bi/multilingual children at ages 5 to 7 versus those at ages 10 to 12

To see whether bi/multilinguals' Mandarin speech proficiency increases with age, twenty-five objective Mandarin speech proficiency parameters were compared between the younger (ages 5 to 7) and older (ages 10 to 12) subgroups of the bi/multilingual children, as noted in table 4.6.

Table 4.6

Comparison of the bi/multilingual children

(ages 5 to 7 versus ages 10 to 12)

Mandarin speech proficiency parameters	Bi/multilingual children (ages 5-7)		Bi/multilingual children (ages 10-12)		(2 tail t-test, unequal)
	Average	Range	Average	Range	*P* value
No. of words	155.77	(47-333)	191.2	(40-363)	0.08
Vocabulary size (no. of different lexemes)	54.87	(15-109)	65.37	(20-129)	0.07
No. of different nouns	5.93	(2-17)	7.43	(2-18)	0.12
No. of different verbs	10.93	(4-19)	14.63	(5-61)	0.06
No. of different classifiers	0.97	(0-2)	1.1	(0-3)	0.33
No. of different grammatical particles	1.83	(0-4)	2.17	(0-5)	0.28
No. of different final particles	1.67	(0-4)	1.47	(0-5)	0.41
No. of phrases	0.2	(0-2)	0.13	(0-2)	0.58
No. of clauses	0.6	(0-3)	0.97	(0-7)	0.23
No. of sentences	11.1	(3-23)	13.03	(4-26)	0.12
No. of simple sentences	8.33	(1-21)	9.53	(1-22)	0.35
No. of complex and compound sentences	2.77	(0-18)	3.5	(0-9)	0.36
No. of incomplete sentences	2.47	(0-18)	2.6	(0-22)	0.9
Sentence length (average no. of words per sentence)	15	(5.22-32)	14.97	(5.4-22.83)	0.98
No. of utterances	27.9	(11-56)	34.2	(7-98)	0.15
No. of different utterances	24.5	(9-47)	30.57	(7-74)	0.08
Utterance length (average no. of words per utterance)	5.85	(3.34-9.88)	6.14	(1.99-10.17)	0.53
No. of errors	5.9	(1-23)	4.73	(1-10)	0.27

No. of phonological errors	1.03	(0-16)	0.57	(0-3)	0.43
No. of tone errors	0.3	(0-4)	0.27	(0-3)	0.87
No. of segmental errors	0.73	(0-15)	0.3	(0-2)	0.41
No. of lexical errors	2.83	(0-16)	2.1	(0-5)	0.31
No. of grammatical errors	2.03	(0-7)	2.07	(0-6)	0.94
Speech rate (average no. of words per second)	1.83	(0.33-3.02)	2.24	(0.17-4.1)	0.07
Speech fluency (average no. of pauses per utterance)	0.23	(0-1)	0.26	(0-1.09)	0.62

Note: No./no. is the abbreviation for Number/number.

No significant differences in objective speech proficiency parameters were found between the two age groups (ages 5 to 7 and ages 10 to 12) of the bi/multilingual children. To some extent, these results implied that bi/multilingual children's Mandarin speech proficiency did not develop as they grew, probably because of living in an English dominant country and lacking adequate (in terms of quantity and quality) Mandarin language input and receiving less exposure to Mandarin.

4.1.2 Self-reports about Mandarin speech proficiency (as reported by the parents and children)

Parents' reports about their children's Mandarin speech proficiency

The data reported here comes from the parents' answers about how frequently their children responded to them in Mandarin when they spoke to their children in Mandarin. This section also reported how well the parents could understand the Mandarin spoken by their children.

Frequency of the children responding to their parents in Mandarin

When asked the question "when you speak Mandarin to your child, how often does your child respond to you in Mandarin?", the parents (n=60) provided the following responses: "always" (n=15, 25%); "often" (n=28, 47%); "sometimes" (n=11, 18%); and "rarely" (n=6, 10%). This parameter correlated with the following children's speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.339, p=0.008;

- Total number of different nouns, r(60)=0.286, p=0.027;
- Total number of different verbs, r(60)=0.280, p=0.030;
- Total number of different final particles, r(60)=0.432, p<0.001;
- Total number of different grammatical particles, r(60)=0.332, p=0.010;
- Total number of incomplete sentences, r(60)=-0.386, p=0.002;
- Average number of words per utterance (utterance length), r(60)=0.460, p<0.001;
- Total number of errors, r(60)=-0.308, p=0.017;
- Total number of grammatical errors, r(60)=-0.279, p=0.031;
- Total number of tone errors, r(60)=-0.300, p=0.020;
- Average number of words per second (speech rate), r(60)=0.501, p<0.001;
- Average number of pauses per utterance (speech fluency), r(60)=-0.303, p=0.018;
- Average number of English code-switches per utterance, r(60)=-0.424, p<0.001; and
- Length of English code-switches (in words), r(60)=-0.401, p=0.002.

The above results showed that the bi/multilingual children most often replied in Mandarin when their parents spoke to them in Mandarin. The frequency with which the children responded to their parents in Mandarin covaried with many of the children's speech proficiency parameters, including the number of different lexical items, utterance length, speech accuracy in pronunciation and grammar, speech rate and fluency, and English code-switches in their speech.

The amount of Mandarin the parents understand when their children speak to them in Mandarin

When asked the question "when your child speaks Mandarin to you, how much can you understand?", sixty of the parents provided their answers as follows: "all of it" (n=39, 65%); "most of it" (n=17, 28%); and "half of it" (n=4, 7%). This parameter correlated with two of the proficiency parameters:

- Total number of errors, r(60)=-0.278, p=0.031; and
- Total number of grammatical errors, r(60)=-0.397, p=0.002.

The results suggested that the number of errors and grammatical errors the children made may impede the parents' comprehension of their children's speech.

Children's reports about their Mandarin speech proficiency

The data presented here came from the children's reports about the language they spoke better and their frequency of speaking Mandarin at home and outside the home.

The language the children speak better

In response to the question "which language do you speak better?", the children's answers (n=60) were: "Mandarin" (n=9, 15%); both "Mandarin and English" (n=18, 30%); "English" (n=31, 52%); and "only Chinese dialects" (n=2, 3%). This parameter correlated with the following speech proficiency parameters:

- Total number of Chinese words, r(60)=0.309, p=0.016;
- Total number of different Chinese words (vocabulary size), r(60)=0.272, p=0.036;
- Total number of Chinese utterances, r(60)=0.329, p=0.010;
- Total number of different Chinese utterances, r(60)=0.332, p=0.010;
- Total number of different nouns, r(60)=0.275, p=0.033; and
- Average number of words per sentence (sentence length), r(60)=0.311, p=0.016.

These results displayed a covariance between the language that the children spoke better, their acquisition of different lexical items, and their production of sentences and utterances.

Frequency of the children speaking Mandarin at home and outside the home

The children's reports about the frequency with which they spoke Mandarin at home and outside the home were summarized in table 4.7.

Table 4.7

Frequency of the children speaking Mandarin at home and outside the home (as reported by the children)

Frequency of speaking Mandarin/child responses	Always	Often	Sometimes	Rarely	Never	Total
at home	25 (42%)	17 (28%)	9 (15%)	9 (15%)	0 (0%)	60
outside home	2 (3%)	8 (13%)	24 (40%)	19 (32%)	7 (12%)	60

Frequency of the children speaking Mandarin at home

When asked the question "how often do you speak Mandarin at home?", twenty-five (out of sixty) of the children answered "always", and seventeen (out of sixty) replied "often" (see table 4.7). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.353$, $p=0.006$
- Total number of different Chinese words (vocabulary size), $r(60)=0.391$, $p=0.002$;
- Total number of different nouns, $r(60)=0.311$, $p=0.016$;
- Total number of different final particles, $r(60)=0.456$, $p<0.001$;
- Total number of different grammatical particles, $r(60)=0.277$, $p=0.032$;
- Total number of complex and compound sentences, $r(60)=0.311$, $p=0.016$;
- Average number of words per sentences (sentences length), $r(60)=0.274$, $p=0.034$;
- Total number of grammatical errors, $r(60)=-0.256$, $p=0.048$; and
- Average number of words per second (speech rate), $r(60)=0.314$, $p=0.015$.

Frequency of the children speaking Mandarin outside the home

When asked the question "how often do you speak Mandarin outside home?", twenty-four (out of sixty) of the children said "sometimes", and nineteen (out of sixty) stated "rarely" (see table 4.7). This parameter correlated with two of the speech proficiency parameters:

- Total number of different final particles, $r(60)=0.280$, $p=0.030$; and
- Total number of sentences, $r(60)=0.257$, $p=0.047$.

These results indicated that the children usually spoke Mandarin more often at home than outside of the home. The children who demonstrated a variety of lexical items, more complex and longer sentences, and a higher speech rate spoke Mandarin at home and outside the home more frequently.

4.1.3 Children's self-estimates of other Mandarin linguistic abilities

This section described the children's self-estimates of their Mandarin linguistic abilities other than Mandarin speaking, such as their ability to write Chinese characters (whether they can write Chinese characters), their ability to read in Mandarin (whether they can read in Mandarin with or without the support of Pin Yin), and their Mandarin listening comprehension (how much Mandarin that they can understand when it is spoken to them).

Children's ability to write Chinese characters

The children's ability to write Chinese characters was evaluated using a writing task. Children were asked by the researcher to write as many Chinese characters as they could in 90 seconds on a white letter-size sheet of paper. Most of the children (54 out of 60) said they could write Chinese characters, and the other six children stated that they could not write any Chinese characters yet. The characters written by each child were manually analyzed by the researcher and used to extract three writing proficiency parameters: the total number of Chinese characters written by the children, the total number of different Chinese characters written by the children, and the total number of correct Chinese characters written by the children, as shown in table 4.8.

Table 4.8

Children's ability to write Chinese characters

(as evaluated in a writing task)

Character numbers/participant numbers	1-10	11-20	21-30	31-40	>40	Total
total Chinese characters produced	26 (48%)	21 (39%)	5 (9%)	1 (2%)	1 (2%)	54
different Chinese characters produced	28 (52%)	22 (40%)	3 (6%)	1 (2%)	0 (0%)	54
correct Chinese characters produced	29 (54%)	21 (39%)	4 (7%)	0 (0%)	0 (0%)	54

Total number of Chinese characters written by the children

Close to half the children (26 out of 54) wrote "between one and ten" Chinese characters, and twenty-one (out of fifty-four) wrote "between eleven and twenty" (see table 4.8). This parameter correlated with four of the speech proficiency parameters:

- Total number of Chinese words, $r(54)=0.295$, $p=0.031$;
- Total number of Chinese utterances, $r(54)=0.298$, $p=0.029$;
- Total number of different Chinese utterances, $r(54)=0.339$, $p=0.012$; and
- Total number of sentences, $r(54)=0.275$, $p=0.044$.

Total number of different Chinese characters written by the children

Around half the children (28 of 54) wrote between "one and ten" different Chinese characters, and twenty-two (out of fifty-four) wrote "between eleven and twenty" (see table 4.8). This parameter correlated with a few of the speech proficiency parameters:

- Total number of Chinese words, r(54)=0.287, p=0.035;
- Total number of Chinese utterances, r(54)=0.303, p=0.026;
- Total number of different Chinese utterances, r(54)=0.315, p=0.020; and
- Total number of sentences, r(54)=0.276, p=0.043.

Total number of correct Chinese characters written by the children

More than half the children (29 out of 54) wrote "between one and ten" correct Chinese characters, and twenty-one (out of fifty-four) wrote "between eleven and twenty" (see table 4.8). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese words, r(54)=0.282, p=0.039;
- Total number of Chinese utterances, r(54)=0.279, p=0.041;
- Total number of different Chinese utterances, r(54)=0.298, p=0.029; and
- Total number of sentences, r(54)=0.271, p=0.048.

These results showed that most of the children could write between one and twenty Chinese characters, and their ability to write Chinese characters covaried with their speech proficiency parameters, such as total number of words, utterances, and sentences.

Children's ability to read Chinse texts in Mandarin

To determine whether the children were able to read in Mandarin, two sheets of printed Chinese materials were provided for the children to read. Both materials were extracted from a Chinese textbook used in grade one of a Chinese elementary school, one of which was named '小小的船/little boat' with the support of Pin Yin while the other one was named '雪孩子/snowman' without the support of Pin Yin. The number of the children who stated that they could read Mandarin, either with or without the support of Pin Yin, was listed in table 4.9.

Table 4.9

Children's ability to read Chinese texts in Mandarin

(as reported by the children)

Chinese texts that children can read/child responses	Yes	No	Total
Reading Chinese texts in Mandarin with the support of Pin Yin	44 (73%)	16 (27%)	60
Reading Chinese texts in Mandarin without the support of Pin Yin	29 (48%)	31 (52%)	60

Children's ability to read Chinese texts in Mandarin with the support of Pin Yin

When asked the question "can you read the Chinese text (named '小小的船/little boat') printed with the support of Pin Yin in Mandarin?", more than half the children (44 out of 60) stated that they could (see table 4.9). This parameter correlated with several of the language proficiency parameters:

- Total number of Chinese words, $r(60)=0.258$, $p=0.047$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.263$, $p=0.042$;
- Total number of sentences, $r(60)=0.261$, $p=0.044$;
- Total number of Chinese characters written, $r(60)=0.408$, $p<0.001$;
- Total number of different Chinese characters written, $r(60)=0.480$, $p<0.001$; and
- Total number of correct Chinese characters written, $r(60)=0.499$, $p<0.001$.

Children's ability to read Chinese texts in Mandarin without the support of Pin Yin

Responding to the question "can you read the Chinese text (named '雪孩子/snowman') printed without the support of Pin Yin in Mandarin?", close to half the children (29 out of 60) indicated that they could, and 31 out of 60 said they could not (see table 4.9). This parameter correlated with many of the children's Mandarin proficiency parameters:

- Total number of different verbs, $r(60)=0.263$, $p=0.042$;
- Total number of different final particles, $r(60)=0.311$, $p=0.016$;
- Total number of sentences, $r(60)=0.268$, $p=0.038$;
- Total number of simple sentences, $r(60)=0.255$, $p=0.050$;
- Average number of words per second (speech rate), $r(60)=0.430$, $p<0.001$;

- Average number of pauses per utterance (speech fluency), $r(60)=-0.259$, $p=0.046$;
- Total number of Chinese characters written, $r(60)=0.306$, $p=0.018$;
- Total number of different Chinese characters written, $r(60)=0.502$, $p<0.001$; and
- Total number of correct Chinese characters written, $r(60)=0.516$, $p<0.001$.

As noted, most of the children declared that they could read the Chinese texts with Pin Yin, and close to half the children indicated that they could read without Pin Yin. These results suggested that the children who could read without Pin Yin in Mandarin had better speech rate and fluency than those who could not. In addition, the children's ability to read Chinese texts in Mandarin (especially without Pin Yin) covaried with their acquisition of Chinese words (such as verbs and final particles), their production of sentences (such as simple sentences), and their ability to write Chinese characters (particularly more different and correct Chinese characters).

Children's Mandarin listening comprehension

The children's self-reports about their Mandarin listening comprehension were summarized in table 4.10.

Table 4.10

Children's Mandarin listening comprehension

(as reported by the children)

The amount of Mandarin that children can understand/child responses	All of it	Most of it	Half of it	A little	None	Total
when my mother speaks to me	28 (47%)	26 (43%)	6 (10%)	0 (0%)	0 (0%)	60
when my father speaks to me	26 (43%)	27 (45%)	6 (10%)	1 (2%)	0 (0%)	60
when my siblings speak to me	34 (74%)	8 (17%)	1 (2%)	3 (7%)	0 (0%)	46
when my grandparents speak to me	13 (48%)	11 (41%)	2 (7%)	1 (4%)	0 (0%)	27
when my Mandarin-speaking relatives speak to me	21 (40%)	20 (38%)	8 (14%)	4 (8%)	0 (0%)	53

when my Mandarin-speaking friends speak to me	40 (68%)	13 (22%)	6 (10%)	0 (0%)	0 (0%)	59
when Mandarin speakers speak to me outside (i.e., Chinese churches, restaurants, and stores)	18 (30%)	28 (47%)	12 (20%)	2 (3%)	0 (0%)	60
when my Mandarin language teachers speak to me during Mandarin language classes	18 (46%)	17 (44%)	4 (10%)	0 (0%)	0 (0%)	39
when my Mandarin-speaking classmates speak to me during the breaks between Mandarin language classes	24 (61%)	13 (33%)	1 (3%)	1 (3%)	0 (0%)	39
when Mandarin speakers speak to me in China	16 (28%)	25 (44%)	12 (21%)	4 (7%)	0 (0%)	57

The amount of Mandarin that the children understand when their mothers speak to them

When asked the question "when your mother speaks Mandarin to you, how much can you understand?", twenty-eight (out of sixty) of the children answered "all of it", and twenty-six (out of sixty) said "most of it" (see table 4.10). This parameter correlated with three of the children's speech proficiency parameters:

- Total number of phonological errors, $r(60)=-0.314$, $p=0.015$;
- Total number of segmental errors, $r(60)=-0.298$, $p=0.021$; and
- Average number of English code-switches per utterance, $r(60)=-0.278$, $p=0.032$.

Most of the children explained that they found it difficult to understand their mothers' Mandarin because she used "new words or words they had never heard" (four responses), "hard words" (two), and "accents or dialects" (two), while some explained that they had difficulty understanding "complicated words" (one), "complex sentences" (one), "idioms" (one), "the words, phrases, and sentences spoken between parents" (one), and "in fast speech rate" (one). It appeared that the children's ability to understand the Mandarin spoken by their mothers correlated with the children's pronunciation accuracy.

The amount of Mandarin that the children understand when their fathers speak to them

When asked the question "when your father speaks Mandarin to you, how much can you understand?", twenty-seven (out of sixty) of the children stated "most of it", and twenty-six (out of sixty) said "all of it" (see table 4.10). This parameter correlated with some of the children's speech proficiency parameters:

- Average number of words per utterance (utterance length), $r(60)=0.304$, $p=0.018$;
- Total number of incomplete sentences, $r(60)=-0.330$, $p=0.010$;
- Total number of phonological errors, $r(60)=-0.391$, $p=0.002$;
- Total number of tone errors, $r(60)=-0.533$, $p<0.001$;
- Average number of words per second (speech rate), $r(60)=0.327$, $p=0.011$;
- Average number of English code-switches per utterance, $r(60)=-0.388$, $p=0.002$; and
- Length of English code-switches (in words), $r(60)=-0.482$, $p<0.001$.

The children who could not understand the Mandarin spoken by their fathers said it was because their fathers used "complicated or hard words, such as words from Chinese traditional literature, i.e., 弟子规/standards for being a good pupil and child" (four responses), or "new words" (four), but also because he "spoke fast" (two), "used fewer words when explaining things than their mother" (one), or had an "accent" (one). It was unexpected that multiple parameters of the children's Mandarin production were significantly correlated with their ability to understand their fathers' Mandarin.

The amount of Mandarin that the children understand when their siblings speak to them

Forty-six (out of 60) of the children who had siblings at home responded to the question "when your siblings speak Mandarin to you, how much can you understand?" Of those 46 respondents, more than half of them (34 out of 46) reported that they understand "all of it", and eight (out of forty-six) indicated "most of it" (see table 4.10). This parameter correlated with a few of the speech proficiency parameters:

- Total number of Chinese words, $r(46)=0.315$, $p=0.033$;
- Total number of different Chinese words (vocabulary size), $r(46)=0.345$, $p=0.019$;
- Total number of Chinese utterances, $r(46)=0.342$, $p=0.020$;
- Total number of different Chinese utterances, $r(46)=0.319$, $p=0.030$;
- Total number of different verbs, $r(46)=0.358$, $p=0.015$;

- Total number of sentences, r(46)=0.355, p=0.015; and
- Total number of simple sentences, r(46)=0.307, p=0.038.

The children reported not understanding the Mandarin spoken by their siblings because either the "words or sentences made no sense" (one response) or the "sentences and utterances were not used in a correct order" (one). As seen, the children understood more of the Mandarin spoken by their siblings than that of their parents who probably used more complicated words or complex sentences. Besides, the children's acquisition of Chinese words, utterances, and sentences positively correlated with their understanding of the Mandarin spoken by their siblings.

The amount of Mandarin that the children understand when their grandparents speak to them

Twenty-seven (out of sixty) of the children had grandparents living with them at home and responded to the question "when your grandparents speak Mandarin to you, how much can you understand?". Of these 27 respondents, around half (13 out of 27) of them indicated that they understand "all of it", and eleven (out of twenty-seven) reported "most of it" (see table 4.10). This parameter correlated with two of the Mandarin language proficiency parameters:

- Total number of different grammatical particles, r(27)=0.398, p=0.040; and
- Total number of Chinese characters written, r(27)=0.438, p=0.022.

The reasons the children could not understand the Mandarin spoken by their grandparents were "dialects" (two responses) and "hard, complex, and new words" (two). As noted, the children's ability to write Chinese characters was positively correlated with their understanding of the Mandarin spoken by their grandparents.

The amount of Mandarin that the children understand when their Mandarin-speaking relatives speak to them

The children (53 out of 60) who had Mandarin-speaking relatives replied to the question "when your Mandarin-speaking relatives speak Mandarin to you, how much can you understand?". Around half of them (21 out of 53) responded that they understand "all of it", and twenty (out of fifty-three) reported "most of it" (see table 4.10). This parameter correlated with several of the children's speech proficiency parameters:

- Total number of errors, r(53)=-0.289, p=0.036;
- Total number of phonological errors, r(53)=-0.311, p=0.024;

- Total number of tone errors, r(53)=-0.283, p=0.040;
- Average number of words per second (speech rate), r(53)=0.324, p=0.018;
- Average number of pauses per utterance (speech fluency), r(53)=-0.293, p=0.033; and
- Average number of English code-switches per utterance, r(53)=-0.304, p=0.027.

The children explained that they sometimes could not understand the Mandarin spoken by their Mandarin-speaking relatives because of "dialects" (three responses), "accents" (two), "new things or new words" (two), and "complicated words or complex sentences" (one). The results showed that the children's overall speech accuracy, especially pronunciation accuracy, speech rate, speech fluency, and frequency of code-switches, covaried with their understanding of the Mandarin spoken by their Mandarin-speaking relatives.

The amount of Mandarin that the children understand when their Mandarin-speaking friends speak to them

The children (59 out of 60) who had Mandarin-speaking friends answered the question "when your Mandarin-speaking friends speak Mandarin to you, how much can you understand?". Most of the children (40 out of 59) responded that they understand "all of it", and thirteen (out of fifty-nine) said "most of it" (see table 4.10). This parameter correlated with three of the children's speech proficiency parameters:

- Total number of errors, r(59)=-0.330, p=0.011;
- Total number of phonological errors, r(59)=-0.380, p=0.003; and
- Total number of segmental errors, r(59)=-0.390, p=0.002.

As for the children who could not understand the Mandarin spoken by their Mandarin-speaking friends, they explained that "they could not understand the Mandarin spoken by new immigrant Chinese children, especially their Chinese jokes or slangs, i.e., Chinese idioms or new popular words (like 囧/embarrassed)" (two responses). In addition, they stated that the "sentences or utterances spoken by their Mandarin-speaking friends did not make sense" (two). As seen, the children's Mandarin pronunciation accuracy positively covaried with their understanding of the Mandarin spoken by their friends.

The amount of Mandarin that the children understand when it is spoken to them outside the home

When asked the question "when Mandarin is spoken to you outside the home, such as in Chinese churches, restaurants, supermarkets, or clubs, how much can you understand?", close to half the children (28 out of 60) said "most of it", eighteen (out of sixty) replied "all of it", and twelve (out of sixty) stated "half of it" (see table 4.10). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.306$, $p=0.017$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.345$, $p=0.007$;
- Average number of words per utterance (utterance length), $r(60)=0.258$, $p=0.047$;
- Total number of errors, $r(60)=-0.299$, $p=0.020$;
- Total number of phonological errors, $r(60)=-0.316$, $p=0.014$;
- Total number of tone errors, $r(60)=-0.356$, $p=0.005$;
- Total number of segmental errors, $r(60)=-0.341$, $p=0.008$;
- Average number of words per second (speech rate), $r(60)=0.363$, $p=0.004$; and
- Average number of pauses per utterance (speech fluency), $r(60)=-0.438$, $p<0.001$.

The children experienced difficulties understanding Mandarin outside the home for a wide range of reasons: "they did not understand new words and grammar that they had not learned yet" (four responses) or "did not know about new things yet" (one); the speaker "spoke too fast" (two), used "difficult and advanced words" (one), "had an accent" (one), or used "long sentences that were too hard to understand" (one); and their "understanding was dependent on social context, e.g., they understood most of the Mandarin spoken by the waiter in Chinese restaurants since it was mostly about the menu, but they could not understand the Mandarin spoken by the pastor in Chinese church" (one). The results showed that, not surprisingly, the ability to understand the Mandarin spoken outside the home covaried with the child's proficiency in Mandarin.

The amount of Mandarin that the children understand when their Mandarin language teachers speak to them during Mandarin language classes

The children (39 out of 60) who attended Mandarin language classes answered the question "when your Mandarin language teachers speak Mandarin to you, how much can you understand?". Close to half of them (18 out of 39) reported that they understand "all of it", and seventeen (out of

thirty-nine) responded “most of it” (see table 4.10). This parameter correlated with three of the children’s speech proficiency parameters:

- Total number of incomplete sentences, $r(39)=-0.380$, $p=0.017$;
- Average number of English code-switches per utterance, $r(39)=-0.459$, $p=0.003$; and
- Length of English code-switches (in words), $r(39)=-0.504$, $p<0.001$.

The children said they could not always understand their Mandarin language teachers because their teachers used “new words” (two responses) or “hard and big words, such as idioms or words from traditional literatures, i.e., 三字经/Trimetric Classic” (two), or they “spoke quickly” (one). The data showed that a child’s ability to comprehend his/her Mandarin language teacher in class was associated with a lower number of incomplete sentences and code-switches to English.

The amount of Mandarin that the children understand when their classmates speak to them during the breaks between Mandarin language classes

The children (39 out of 60) who attended Mandarin language classes answered the question “when your classmates speak to you in Mandarin during the breaks between Mandarin language classes, how much can you understand?”. More than half the respondents (24 out of 39) reported that they understand “all of it”, and thirteen (out of thirty-nine) responded “most of it” (see table 4.10). This parameter correlated with the children’s speech proficiency parameter “total number of incomplete sentences”, $r(39)=-0.346$, $p=0.031$.

The children could not understand everything their classmates said in Mandarin for the following reasons: “they did not know new words or grammar” (two responses), “classmates who came from China used too many professional words and sentences” (one), the classmates “spoke too fast” (one), and “they could not catch what classmates said when many of them spoke simultaneously” (one). These results showed that the children who used more incomplete sentences had more issues with understanding the other children’s Mandarin.

The amount of Mandarin that the children understand on their trips to China

The question “when people speak Mandarin to you in China, how much can you understand?” was answered by 57 (out of 60) children who could recall their language experiences in China. Close to half of them (25 out of 57) reported that they understood “most of it”, and sixteen (out of fifty-seven) indicated “all of it” (see table 4.10). This parameter correlated with the speech

proficiency parameter "average number of English code-switches per utterance", r(57)=-0.262, p=0.049.

The children said they could not understand the Mandarin spoken by Mandarin speakers in China due to "dialects" (four responses), "new words" (three), "accents" (two), and "fast speaking speed" (two). These results showed a covariance between the children's code-switches to English and their understanding of the Mandarin in China.

4.2 Sociolinguistic Factors in the Children's Mandarin Heritage Language Maintenance and Proficiency: Demographic Parameters

This section displayed the correlations between the children's Mandarin language proficiency and their demographic backgrounds, especially their parents' first language and education backgrounds, their ability to speak a language besides Mandarin and English, their gender, their country of birth, and their age (including their age of arrival if they were born in China and brought to Canada). All the information was collected from the responses provided by both the parents and the children.

Parents' first language

When answering the question "was Mandarin the sole language used in your home during your childhood (≤12 years old)?", most of the parents (41 out of 60) indicated "no" because they spoke Chinese dialects in addition to Mandarin, and the rest (19 parents) responded "yes". This parameter correlated with two of the children's Mandarin speech proficiency parameters:

- Total number of different nouns, r(60)=-0.275, p=0.033; and
- Total number of grammatical errors, r(60)=0.353, p=0.006.

The first language of the parents' spouses

When asked the question "what is your spouse's first language?", most of the parents (44 out of 60) reported that their spouse spoke Mandarin as a first language, thirteen (out of sixty) replied "Chinese dialects", and three (out of sixty) indicated both "Mandarin and English". This parameter correlated with several of the speech proficiency parameters:

- Total number of Chinese utterances, r(60)=0.272, p=0.035;

- Total number of different Chinese utterances, r(60)=0.281, p=0.029;
- Total number of different verbs, r(60)=0.406, p<0.001;
- Total number of complex and compound sentences, r(60)=0.282, p=0.029; and
- Total number of errors, r(60)=-0.273, p=0.035.

These results showed that the children's acquisition of lexical items and their production of utterances and complex sentences, as well as overall speech accuracy (particularly grammatical accuracy), covaried with their parents' first language.

Parents' education backgrounds

Based on a total of sixty of the parents' answers, the highest education levels that parents achieved are as follows: Some Secondary (n=1, 2%), Middle School (n=0, 0%), High School (n=1, 2%), Technical Secondary (n=4, 7%), Junior College (n=7, 11%), Adult Education (n=2, 3%), Bachelor's (n=28, 46%), Master's (n=12, 20%), PhD (n=1, 2%), and Post-Doctoral (n=4, 7%). This parameter correlated with some of the language proficiency parameters:

- Total number of different final particles, r(60)=0.334, p=0.009;
- Total number of different Chinese characters written, r(60)=0.308, p=0.017; and
- Total number of correct Chinese characters written, r(60)=0.272, p=0.035.

As noted, most of the parents (45 out of 60) achieved at least a "Bachelor's" as their highest education level. It appeared that the children's ability to write different and correct Chinese characters and their acquisition of different final particles covaried with their parents' education backgrounds.

Children's language ability besides Mandarin and English

The children's reports about their language ability besides Mandarin and English were presented in table 4.11.

Table 4.11

Children's language ability besides Mandarin and English

(as reported by the children)

Children's language ability/child responses	Yes	No	Total
I can speak Chinese dialect(s) besides Mandarin	21 (35%)	39 (65%)	60

I can speak other language(s) besides Chinese and English	45 (75%)	15 (25%)	60

Children's ability to speak Chinese dialect(s) besides Mandarin

When asked the question "can you speak Chinese dialect(s)?", most of the children (39 out of 60) answered "no", and the rest (21 out of 60) indicated "yes", such as Cantonese (see table 4.11). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of different classifiers, r(60)=-0.319, p=0.013;
- Average number of words per sentence (sentence length), r(60)=-0.287, p=0.026;
- Total number of grammatical errors, r(60)=-0.259, p=0.046; and
- Length of English code-switches (in words), r(60)=-0.263, p=0.043.

It was worthy to note that, among the children, fewer productions of different classifiers and shorter sentence lengths, as well as their possibility of making grammatical errors and shifting to English, covaried with their ability to speak Chinese dialects.

Children's ability to speak other language(s) besides Chinese and English

When asked the question "can you speak language(s) besides Chinese and English?", most of the children (45 out of 60) indicated "yes", such as French, Spanish, or Japanese, and the rest (15 out of 60) stated "no" (see table 4.11). This parameter correlated with the Mandarin speech proficiency parameter "average number of words per second (speech rate)", r(60)=0.334, p.=0.009.

It seemed that the children's speech rate tended to be higher if they could speak other language(s) in addition to Chinese and English.

Children's gender

Most of the child participants (39 out of 60) were female, and twenty-one (out of sixty) were male. This parameter correlated with a few of the speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.257, p=0.047;
- Average number of words per utterance (utterance length), r(60)=0.292, p=0.023;
- Total number of incomplete sentences, r(60)=-0.347, p=0.007;
- Average number of English code-switches per utterance, r(60)=-0.282, p=0.029; and
- Length of English code-switches (in words), r(60)=-0.288, p=0.026.

These results showed that the children's Mandarin speech proficiency covaried with their

gender, where the girls obtained a larger number of words and produced more complete sentences and longer utterances, as well as fewer English code-switches in their speech, than the boys.

Children's country of birth

Based on a total of sixty of the parents' reports, most of the child participants (47 out of 60) were born in Canada, and thirteen (out of sixty) were born in China and brought to Canada by the age of 3. This parameter correlated with several of the speech proficiency parameters:

- Total number of Chinese words, $r(60)=-0.283$, $p=0.029$;
- Total number of different Chinese words (vocabulary size), $r(60)=-0.295$, $p=0.022$;
- Average number of words per utterance (utterance length), $r(60)=-0.293$, $p=0.023$;
- Total number of errors, $r(60)=0.283$, $p=0.028$;
- Total number of lexical errors, $r(60)=0.279$, $p=0.031$; and
- Average number of words per second (speech rate), $r(60)=-0.494$, $p<0.001$.

These results indicated that the children who were born in Canada tended to have lower Mandarin speech proficiency parameters than the children born in China.

Children's age (at the time of the study)

The ages of the child participants ranged as follows: "age 5" (n=7, 11%), "age 6" (n=10, 17%), "age 7" (n=13, 22%), "age 10" (n=15, 25%), "age 11" (n=10, 17%), and "age 12" (n=5, 8%). This parameter correlated with three of the children's Mandarin language proficiency parameters:

- Total number of Chinese characters written, $r(60)=0.314$, $p=0.015$;
- Total number of different Chinese characters written, $r(60)=0.270$, $p=0.037$; and
- Total number of correct Chinese characters written, $r(60)=0.308$, $p=0.017$.

These results showed that that children's ability to write Chinese characters increased with their age.

Children's age of arrival (if they were born in China and brought to Canada)

The parents (13 out of 60) of the children born in China answered the question "what age was your chid when you brought her/him to Canada?". Around half the parents (7 out of 13) indicated "by the age of 3", and the others reported "by the age of 2" (2 out of 13) and "by the age of 1" (4 out of 13). This parameter correlated with some of the speech proficiency parameters:

- Total number of incomplete sentences, $r(13)=-0.569$, $p=0.042$;
- Total number of grammatical errors, $r(13)=-0.603$, $p=0.029$;
- Average number of words per second (speech rate), $r(13)=0.886$, $p<0.001$; and
- Average number of pauses per utterance (speech fluency), $r(13)=-0.601$, $p=0.030$.

These results demonstrated that the children's production of incomplete sentences and the number of pauses in their speech were higher, while their speech rate, fluency, and number of errors were lower, if they were brought to Canada at a younger age.

4.3 Sociolinguistic Factors in the Children's Mandarin Heritage Language Maintenance and Proficiency: Language Attitude Parameters

This section explored the parents' and children's language attitudes, based on the parents' reports in the questionnaire and the children's responses in the interview. In addition, the correlations between the sociolinguistic parameters of the parents' and children's language attitudes on the one hand and the children's Mandarin language proficiency parameters on the other hand were presented in this section.

4.3.1 Parents' language attitudes (as reported by the parents)

The parents' responses about their attitudes towards their children's Chinese culture and Mandarin language maintenance were summarized here.

Parents' attitudes towards their children's Chinese culture maintenance

The parents' reports about the importance of their children's Chinese culture maintenance were listed in table 4.12 on a Likert scale that included "very important", "important", "neutral" (neither important nor unimportant), "low importance", and "not important at all".

Table 4.12

Parents' attitudes towards their children's Chinese culture maintenance (as reported by the parents)

Level of importance/ parent responses	Very important	Important	Neutral	Low importance	Not important at all	Total
My child identifies himself/herself as Chinese	27 (45%)	14 (23%)	19 (32%)	0 (0%)	0 (0%)	60
My child identifies himself/herself as Chinese Canadian	14 (23%)	19 (32%)	21 (35%)	5 (8%)	1 (2%)	60
My child follows Chinese traditional culture	18 (30%)	28 (47%)	12 (20%)	2 (3%)	0 (0%)	60
My child retains Chinese traditional etiquette and custom	18 (30%)	26 (44%)	14 (23%)	2 (3%)	0 (0%)	60
My child celebrates Chinese traditional festivals	16 (27%)	30 (50%)	12 (20%)	2 (3%)	0 (0%)	60
My child uses a Chinese name	12 (20%)	20 (33%)	26 (44%)	2 (3%)	0 (0%)	60
My child attends Mandarin Chinese language schools	19 (32%)	28 (47%)	9 (15%)	4 (6%)	0 (0%)	60
My child makes Mandarin-speaking friends	13 (22%)	32 (53%)	13 (22%)	2 (3%)	0 (0%)	60
My child gets married to a Mandarin-speaking	4 (7%)	14 (23%)	35 (58%)	4 (7%)	3 (5%)	60

spouse						
My child can speak Mandarin and English and becomes bilingual	39 (65%)	19 (32%)	2 (3%)	0 (0%)	0 (0%)	60

Parent's responses to the statement "my child identifies himself/herself as Chinese"

When responding to the question "how important is it for you that your child identifies himself/herself as Chinese?", twenty-seven (out of sixty) of the parents indicated "very important", nineteen (out of sixty) replied "neutral" (neither important nor unimportant), and fourteen (out of sixty) said "important" (see table 4.12). This parameter correlated with the children's Mandarin speech proficiency parameter "total number of tone errors", r(60)=-0.272, p=0.036.

Parent's responses to the statement "my child identifies himself/herself as Chinese Canadian"

In response to the question "how important is it for you that your child identifies himself/herself as Chinese Canadian?", twenty-one (out of sixty) of the parents stated "neutral" (neither important nor unimportant), nineteen (out of sixty) replied "important", and fourteen (out of sixty) answered "very important" (see table 4.12). This parameter correlated with two of the children's Mandarin speech proficiency parameters:

- Total number of errors, r(60)=-0.277, p=0.032; and
- Average number of words per second (speech rate), r(60)=0.275, p=0.034.

Parent's responses to the statement "my child follows Chinese traditional culture"

When responding to the question "how important is it for you that your child follows Chinese traditional culture?", twenty-eight (out of sixty) of the parents indicated this was "important" for them, eighteen (out of sixty) declared "very important", and twelve (out of sixty) responded "neutral" (neither important nor unimportant) (see table 4.12). This parameter correlated with some of the Mandarin speech proficiency parameters:

- Total number of incomplete sentences, r(60)=-0.263, p=0.042;
- Total number of grammatical errors, r(60)=-0.282, p=0.029;
- Total number of phonological errors, r(60)=-0.260, p=0.045; and
- Total number of tone errors, r(60)=-0.304, p=0.018.

Parent's responses to the statement "my child retains Chinese traditional etiquette and custom"

When answering the question "how important is it for you that your child retains Chinese traditional etiquette and custom?", twenty-six (out of sixty) of the parents replied "important", eighteen (out of sixty) responded "very important", and fourteen (out of sixty) answered "neutral" (neither important nor unimportant) (see table 4.12). This parameter correlated with the speech proficiency parameter "total number of grammatical errors", $r(60)=-0.263$, $p=0.042$.

Parent's responses to the statement "my child celebrates Chinese traditional festivals"

When asked the question "how important is it for you that your child celebrates Chinese traditional festivals?", half the parents (30 out of 60) answered "important", sixteen (out of sixty) replied "very important", and twelve (out of sixty) responded "neutral" (neither important nor unimportant) (see table 4.12). This parameter correlated with the speech proficiency parameter "total number of tone errors", $r(60)=-0.276$, $p=0.033$.

Parent's responses to the statement "my child uses a Chinese name"

When asked "how important is it for you that your child uses a Chinese name?", twenty-six (out of sixty) of the parents stated "neutral" (neither important nor unimportant), twenty (out of sixty) answered "important", and twelve (out of sixty) responded "very important" (see table 4.12). This parameter correlated with two of the proficiency parameters:

- Total number pf tone errors, $r(60)=-0.255$, $p=0.050$; and
- Average number of English code-switches per utterance, $r(60)=-0.262$, $p=0.043$.

Parent's responses to the statement "my child attends Mandarin Chinese language school"

In response to the question "how important is it for you that your child attends Mandarin Chinese language school?", close to half the parents (28 out of 60) said "important", and nineteen (out of sixty) responded "very important" (see table 4.12). This parameter correlated with several of the speech proficiency parameters:

- Total number of phrases, $r(60)=0.272$, $p=0.035$;
- Total number of phonological errors, $r(60)=-0.311$, $p=0.015$; and
- Total number of segmental errors, $r(60)=-0.294$, $p=0.022$.

Parent's responses to the statement "my child makes Mandarin-speaking friends"

With regards to the question "how important is it for you that your child makes Mandarin-speaking friends?", more than half the parents (32 out of 60) stated "important". The number of responses "very important" and "neutral" (neither important nor unimportant) were equal (13 out of 60) (see table 4.12). Yet, no correlations were detected between this parameter and the children's Mandarin language proficiency parameters.

Parent's responses to the statement "my child gets married to a Mandarins-speaking spouse"

When asked the question "how important is it for you that your child gets married to a Mandarin-speaking spouse?", most of the parents (35 out of 60) replied "neutral" (neither important nor unimportant), and fourteen (out of sixty) indicated "important" (see table 4.12). This parameter correlated with the speech proficiency parameter "average number of English code-switches per utterance", $r(60)=-0.259$, $p=0.045$.

Parent's responses to the statement "my child can speak Mandarin and English and becomes bilingual"

With regard to the question "how important is it for you that your child can speak Mandarin and English and becomes bilingual?", thirty-nine (out of sixty) of the parents replied "very important", and nineteen (out of sixty) answered "important" (see table 4.12). This parameter correlated with several of the children's Mandarin speech proficiency parameters:

- Total number of errors, $r(60)=-0.345$, $p=0.007$;
- Total number of grammatical errors, $r(60)=-0.444$, $p<0.001$;
- Total number of phonological errors, $r(60)=-0.296$, $p=0.022$; and
- Total number of tone errors, $r(60)=-0.436$, $p<0.001$.

In general, it appeared that the children's overall speech accuracy and speech rate, as well as fewer shifts to English in their speech, covaried with their parents' positive attitudes toward their Chinese culture maintenance.

Parents' attitudes towards their children's Mandarin language maintenance

The parents' attitudes towards their children's Mandarin language maintenance were

examined via their level of agreement with several statements provided below and recorded on a Likert scale with the options “strongly agree”, “agree”, “neutral” (neither agree nor disagree), “disagree”, and “strongly disagree”. See table 4.13 for a detailed break-down of the parents’ responses.

Table 4.13

Parents’ attitudes towards their children’s Mandarin language maintenance (as reported by the parents)

Level of agreement /parent responses	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
The ability to speak Mandarin will benefit my child’s life and future career	46 (77%)	12 (20%)	2 (3%)	0 (0%)	0 (0%)	60
The ability to speak Mandarin will assist my child in Canada by making it easier to get involved in the Chinese community and Chinese cultural activities	36 (60%)	21 (35%)	3 (5%)	0 (0%)	0 (0%)	60
The ability to speak Mandarin is essential for my child to keep close relationships with relatives residing in China	40 (66%)	19 (32%)	1 (2%)	0 (0%)	0 (0%)	60
The ability to speak Mandarin is important for my child to maintain communication with family members and relatives who can only speak Mandarin	45 (75%)	15 (25%)	0 (0%)	0 (0%)	0 (0%)	60
The ability to speak Mandarin and English will contribute to my child’s cognitive development and help him/her become smarter	32 (53%)	19 (32%)	9 (15%)	0 (0%)	0 (0%)	60

The ability to speak Mandarin and English every day is easy for my child	29 (48%)	24 (40%)	5 (9%)	2 (3%)	0 (0%)	60
I feel more comfortable when my child speaks Mandarin to me	26 (43%)	22 (37%)	11 (18%)	1 (2%)	0 (0%)	60
I feel embarrassed if my child cannot speak Mandarin	9 (15%)	25 (42%)	20 (33%)	6 (10%)	0 (0%)	60
The ability to speak English is more important than speaking Mandarin for my child in Canada	7 (12%)	26 (43%)	15 (25%)	8 (14%)	4 (6%)	60
The ability to speak Mandarin is useless for my child in Canada	0 (0%)	0 (0%)	1 (2%)	36 (60%)	23 (38%)	60

Parent's responses to the statement "the ability to speak Mandarin will benefit my child's life and future career"

Most of the parents (46 out of 60) "strongly agreed" with this statement, and twelve (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with several of the children's speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.256$, $p=0.048$;
- Total number of Chinese utterances, $r(60)=0.487$, $p<0.001$;
- Total number of different Chinese utterances, $r(60)=0.427$, $p<0.001$;
- Total number of different nouns, $r(60)=0.260$, $p=0.045$;
- Total number of clauses, $r(60)=0.347$, $p=0.007$;
- Total number of incomplete sentences, $r(60)=-0.370$, $p=0.004$; and
- Average number of English code-switches, $r(60)=-0.281$, $p=0.029$.

Parents' responses to the statement "the ability to speak Mandarin will assist my child in Canada by making it easier to get involved in the Chinese community and Chinese cultural activities"

More than half the parents (36 out of 60) "strongly agreed" with this statement, and twenty-one (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese words, r(60)=0.303, p=0.019;
- Total number of Chinese utterances, r(60)=0.393, p=0.002;
- Total number of different Chinese utterances, r(60)=0.386, p=0.002;
- Total number of different nouns, r(60)=0.307, p=0.017;
- Total number of clauses, r(60)=0.262, p=0.043; and
- Total number of incomplete sentences, r(60)=-0.265, p=0.041.

Parents' responses to the statement "the ability to speak Mandarin is essential for my child to keep close relationships with relatives residing in China"

Forty (out of sixty) of the parents "strongly agreed" with this statement, and nineteen (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with a few of the Mandarin language proficiency parameters:

- Total number of different verbs, r(60)=0.259, p=0.046;
- Total number of different classifiers, r(60)=0.276, p=0.033;
- Total number of clauses, r(60)=0.255, p=0.050; and
- Total number of correct Chinese characters written, r(60)=0.255, p=0.050.

Parents' responses to the statement "the ability to speak Mandarin is important for my child to maintain communication with family members and relatives who can only speak Mandarin"

Most of the parents (45 out of 60) "strongly agreed" with this statement, and the rest of them (15 out of 60) "agreed" with it (see table 4.13). This parameter correlated with three of the speech proficiency parameters:

- Total number of different verbs, r(60)=0.331, p=0.010;
- Total number of different classifiers, r(60)=0.336, p=0.009; and
- Total number of different grammatical particles, r(60)=0.263, p=0.042.

Parents' responses to the statement "the ability to speak Mandarin and English will contribute to my child's cognitive development and help him/her become smarter"

Around half the parents (32 out of 60) "strongly agreed" with this statement, and nineteen (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with the Mandarin speech proficiency parameter "total number of lexical errors", r(60)=-0.307, p=0.017.

Parents' responses to the statement "the ability to speak Mandarin and English every day is easy for my child"

Close to half the parents (29 out of 60) "strongly agreed" with this statement, and twenty-four (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese words, r(60)=0.268, p=0.039;
- Total number of Chinese utterances, r(60)=0.296, p=0.022;
- Total number of different Chinese utterances, r(60)=0.295, p=0.022;
- Total number of different nouns, r(60)=0.266, p=0.040; and
- Total number of incomplete sentences, r(60)=-0.272, p=0.036.

Parents' responses to the statement "I feel more comfortable when my child speaks Mandarin to me"

Twenty-six (out of sixty) of the parents "strongly agreed" with this statement, and twenty-two (out of sixty) "agreed" with it (see table 4.13). This parameter correlated with the speech proficiency parameter "total number of different classifiers", r(60)=0.301, p=0.019.

Parents' responses to the statement "I feel embarrassed if my child can not speak Mandarin"

Twenty-five (out of sixty) of the parents "agreed" with the above statement, and twenty (out of sixty) felt "neutral" (neither agree nor disagree) about it (see table 4.13). This parameter correlated with three of the children's speech proficiency parameters:

- Total number of grammatical errors, r(60)=-0.271, p=0.036;
- Total number of phonological errors, r(60)=-0.362, p=0.004; and
- Total number of segmental errors, r(60)=-0.317, p=0.014.

Parents' responses to the statement "the ability speak English is more important than speaking Mandarin for my child in Canada"

Twenty-six (out of sixty) of the parents "agreed" with this statement, and fifteen (out of sixty) felt "neutral" (neither agree nor disagree) about it (see table 4.13). This parameter correlated with a few of the speech proficiency parameters:

- Total number of errors, r(60)=0.291, p=0.024;
- Total number of lexical errors, r(60)=0.261, p=0.044; and
- Average number of English code-switches per utterance, r(60)=0.280, p=0.030.

Parents' responses to the statement "the ability to speak Mandarin is useless for my child in Canada"

More than half the parents (36 out of 60) "disagreed" with this statement, and twenty-three (out of sixty) "strongly disagreed" with this statement (see table 4.13). This parameter correlated with several of the children's Mandarin language proficiency parameters:

- Average number of words per utterances (utterance length), r(60)=0.258, p=0.046;
- Total number of lexical errors, r(60)=-0.281, p=0.030;
- Average number of English code-switches per utterance, r(60)=-0.270, p=0.037; and
- Total number of correct Chinese characters written, r(60)=0.265, p=0.040.

Overall, the results showed that the parents held positive and supportive attitudes towards their children's Mandarin language maintenance. As noted, the results displayed a covariance between the parents' attitudes towards their children's Mandarin language maintenance and the children's acquisition of different Chinese lexical items such as nouns, verbs, classifiers, and grammatical particles, their production of different clauses, sentences, and utterances, their speech accuracy, their number of English code-switches, and their ability to write Chinese characters.

4.3.2 Children's language attitudes (as reported by the children)

The language attitudes held by the children were investigated with the help of interview questions about their language choices and preferences, as well as their feelings concerning language use, as summarized in table 4.14.

Table 4.14

Children's language attitudes

(as reported by the children)

Languages/Child responses to interview questions	Mandarin	Mandarin and English	English	Only Chinese dialects	Total
The language that I speak more often now	5 (9%)	26 (43%)	27 (45%)	2 (3%)	60
The language that I want to speak better	14 (23%)	34 (57%)	10 (17%)	2 (3%)	60
The language that I have more fun with	13 (22%)	31 (51%)	13 (22%)	3 (5%)	60
The language that I find more useful	7 (12%)	42 (70%)	11 (18%)	0 (0%)	60
I feel happier when I speak this language	6 (10%)	39 (65%)	14 (23%)	1 (2%)	60
I feel more confident when I speak this language	7 (12%)	21 (35%)	29 (48%)	3 (5%)	60
I feel more clever when I speak this language	9 (15%)	30 (50%)	20 (33%)	1 (2%)	60
I feel prouder when I speak this language	14 (24%)	31 (51%)	12 (20%)	3 (5%)	60
I feel more popular when I speak this language	8 (13%)	33 (55%)	17 (29%)	2 (3%)	60
The language I prefer to speak when I am happy	4 (6%)	37 (62%)	16 (27%)	3 (5%)	60
The language I prefer to speak when I am sad	6 (10%)	31 (52%)	21 (35%)	2 (3%)	60
The language I prefer to speak when people speak Mandarin to me	23 (39%)	26 (43%)	11 (18%)	0 (0%)	60

The language that the children speak more (at the time of the study)

When asked the question "which language do you speak more often now?", twenty-seven (out of sixty) of the children stated "English", and twenty-six (out of sixty) indicated both "Mandarin and English" (see table 4.14). This parameter correlated with three of the speech proficiency parameters:

- Total number of different final particles, $r(60)=0.290$, $p=0.025$;
- Average number of words per sentence (sentence length), $r(60)=0.281$, $p=0.030$; and
- Total number of grammatical errors, $r(60)=-0.270$, $p=0.037$.

One child reported speaking English more often because he/she "attended public schools", and another child explained that he/she spoke "Mandarin" more often due to "previous experiences of being in China, which now made it easier to learn Mandarin".

The language the children want to speak better

When asked the question "which language do you want to speak better?", more than half the children (34 out of 60) said both "Mandarin and English", fourteen (out of sixty) stated "Mandarin", and ten (out of sixty) replied "English" (see table 4.14). No correlations were found between this parameter and Mandarin language proficiency.

Among the children who wanted to speak "Mandarin" better, their reasons for wanting to do so were as follows: "Chinese is a funny, interesting, and useful language" (three responses); "I want to understand what my parents and grandparents say when they speak Mandarin" (two); and "more and more Chinese immigrants are moving to Canada" (one). When the children who wanted to speak "English" better explained their reasons, they pointed out that "they currently live in Canada" (three responses), "they already know English well" (two), "he/she does not know too much about English so he/she wants to learn more" (one), and "his/her friends speak English" (one). As for the children who wanted to speak both "Mandarin and English" well, they explained that "he/she wants to exchange ideas with English speakers and Mandarin speakers" (one response) and "he/she wants to know Mandarin and English well to become bilingual" (one).

The language the children have more fun with

When asked the question "which language do you have more fun with?", around half the children (31 out of 60) answered both "Mandarin and English". The number of responses for either

"Mandarin" or "English" were equal (13 out of 60) (see table 4.14). This parameter correlated with two of the language proficiency parameters:

- Average number of English code-switches per utterance, r(60)=0.255, p=0.049; and
- Total number of Chinese characters written, r(60)=0.327, p=0.011.

The children who felt that "Mandarin" was more fun explained that "they like Chinese writing because it looks like painting and arts" (three responses), that "Mandarin sounds different and cool" (two), that "they can learn new words in Mandarin rather than just English words" (two), that "not too many people know Mandarin so he/she feels cool if he/she can speak Mandarin" (one), that "food names are difficult to say in Mandarin so he/she is curious to learn new terms" (one), that "Chinese words are more challenging than English words" (one), that "he/she can share secrets with friends who can speak Mandarin at public schools" (one), and that "he/she does not know how to speak English sometimes" (one). Those children who believed "English" was more fun, felt so because "English is easier than Mandarin" (four responses) and "is spoken by more people than Mandarin" (one), "English letters can be used to spell different words" (two), "they are better at answering questions in English" (two), "he/she plays English video games" (one), and "his/her friends speak English" (one). One child who felt "Mandarin and English" were both fun explained that she/he "was interested in both Chinese and English cultures".

The language the children find more useful

When asked the question "which language do you feel is more useful?", most of the children (42 out of 60) answered both "Mandarin and English", and eleven (out of sixty) responded "English" (see table 4.14). This parameter correlated with the speech proficiency parameter "total number of different verbs", r(60)=0.333, p=0.009.

Some children reported that "Mandarin" was more useful because "they speak Mandarin as their home language" (two responses), "he/she is already able to speak Mandarin" (one), "he/she wants to speak Mandarin" (one), and "he/she wants to visit China in the future" (one). The children who thought that "English" was more useful explained that "they use English more at school" (two responses), that "he/she stays in Canada" (one), that "he/she cannot remember too much Mandarin" (one), and that "he/she uses English more when reading bedtime stories, playing games (such as drawing or Jig-saw Puzzle), and playing with toys" (one). The children who found both "Mandarin and English" equally useful thought that "they use English in Canada and use Mandarin in China"

(nine responses), that "they speak Mandarin to the people who are Chinese and Mandarin speakers (i.e., grandparents, or classmates) and can help them as an English to Mandarin translator and teach them English" (six), that "they like both Mandarin and English languages" (four), that "an ability to speak Mandarin helps them make Chinese friends" (two), and that "he/she speaks English with friends at school and speak Mandarin with parents at home" (one).

The language the children feel happier with

In response to the question "which language do you feel happier speaking?", thirty-nine (out of sixty) of the children reported both "Mandarin and English", and fourteen (out of sixty) answered "English" (see table 4.14). This parameter correlated with several of the children's speech proficiency parameters:

- Average number of words per utterance (utterance length), r(60)=0.286, p=0.026;
- Average number of words per sentence (sentence length), r(60)=0.256, p=0.048;
- Total number of complex and compound sentences, r(60)=0.271, p=0.036;
- Total number of different verbs, r(60)=0.277, p=0.032;
- Total number of different final particles, r(60)=0.383, p=0.003;
- Total number of tone errors, r(60)=-0.281, p=0.029;
- Average number of words per second (speech rate), r(60)=0.332, p=0.010; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.267, p=0.039.

The children felt happier while speaking "Mandarin" because "he/she needs to chat with grandparents" (one response), and his/her "parents can understand Mandarin better" (one). Those who felt happier while speaking "English" said they "feel English is easier" (three responses) and "they know more words in English than in Mandarin" (two).

The language the children feel more confident with

When asked the question "which language do you feel more confident speaking?", close to half the children (29 out of 60) said "English", and twenty-one (out of sixty) replied both "Mandarin and English" (see table 4.14). This parameter correlated with three of the proficiency parameters:

- Total number of different final particles, r(60)=0.259, p=0.046;
- Total number of simple sentences, r(60)=-0.283, p=0.029; and

- Length of English code-switches (in words), r(60)=-0.270, p=0.037.

The children who felt more confident when speaking "Mandarin" explained that "they learn Mandarin more now" (two responses) and that "he/she wants to learn new things" (one). As for the children who felt more confident when speaking "English", their reasons were as follows: "they know more English words" (three responses); "sometimes he/she feels confused about Mandarin" (one); "he/she speaks English better" (one); and "he/she feels English is easier" (one). The children who felt confident when speaking both "Mandarin and English" explained that "he/she is able to speak both Mandarin and English" (one response) and that "he/she uses Mandarin Chinese at home and English at school" (one).

The language the children feel clever with

When asked the question "speaking which language do you feel clever speaking?", half the children (30 out of 60) indicated both "Mandarin and English", and twenty (out of sixty) stated "English" (see table 4.14). This parameter correlated with several of the children's proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.313, p=0.015;
- Average number of words per utterance (utterance length), r(60)=0.257, p=0.048;
- Average number of words per sentence (sentence length), r(60)=0.345, p=0.007;
- Total number of different nouns, r(60)=0.406, p<0.001; and
- Total number of different final particles, r(60)=0.262, p=0.043.

The children who felt more clever when speaking "Mandarin" indicated that "they feel different from others who only speak English, and they feel smarter if they can speak Mandarin in addition to English" (two responses), that "he/she feels that Chinese characters are challenging to learn, so he/she feels clever if he/she is capable of speaking Mandarin and writing Chinese characters" (one), that "he/she already knows Mandarin very well" (one), and that "not too many people know how to speak Mandarin, so he/she feels clever that he/she can" (one). The children who felt clever when speaking "English" had the following reasons: "they feel Mandarin is harder than English" (two responses); "he/she already knows English well" (one); "English words can be spelt by letters but Chinese words are needed to be written down in characters" (one); "he/she reads books published in English most of the time" (one); and "he/she is able to read and write in English" (one). As for the children who replied that they felt clever when speaking both "Mandarin and

English", their reasons were that "his/her Mandarin language assignments can be done only in Mandarin" (one response) and "he/she does well in both Mandarin and English" (one).

The language the children feel prouder with

Responding to the question "which language do you feel prouder speaking?", around half the children (31 out of 60) replied both "Mandarin and English", fourteen (out of sixty) stated "Mandarin", and twelve (out of sixty) reported "English" (see table 4.14). This parameter correlated with four of the children's speech proficiency parameters:

- Total number of different verbs, r(60)=0.304, p=0.018;
- Total number of clauses, r(60)=0.262, p=0.043;
- Total number of errors, r(60)=-0.279, p=0.031; and
- Total number of phonological errors, r(60)=-0.261, p=0.044.

Those children who selected both "Mandarin and English" had the following explanations for their choice: "they can speak Mandarin and English at the same time" (two responses); "he/she uses English in Canada and Mandarin in China" (one); "many people know Mandarin and English" (one); and "he/she has to speak Mandarin with parents and English with friends" (one). The children who felt prouder when speaking "Mandarin" gave the following reasons for this feeling: "he/she already knows Mandarin" (one response); "he/she feels prouder if he/she can correctly speak Mandarin that he/she is not good at yet" (one); "he/she feels different from others who cannot speak Mandarin but just speak English" (one); and "he/she feels good about himself/herself when speaking Mandarin" (one). In addition, the children felt prouder when speaking "English" because "he/she already knows more English" (one response) and "he/she uses English more often at school" (one).

The language the children feel more popular with

In response to the question "which language do you feel more popular speaking?", more than half the children (33 out of 60) stated both "Mandarin and English", and seventeen (out of sixty) answered "English" (see table 4.14). This parameter correlated with some of the children's Mandarin language proficiency parameters:

- Total number of different verbs, r(60)=0.286, p=0.027;
- Total number of different final particles, r(60)=0.316, p=0.014;

- Total number of phrases, r(60)=0.275, p=0.033; and
- Total number of Chinese characters written, r(60)=0.332, p=0.010.

The reasons provided by children who felt more popular when speaking both "Mandarin and English" were as follows: "he/she is able to speak Mandarin though his/her friends say that Mandarin is hard" (one response), "he/she uses Mandarin and/or English based on where he/she is (like in Canada or China, at school or home) and depending on his/her understanding of the language (such as Mandarin or English) spoken by other people" (one), and "he/she believes people become popular if he/she knows more languages" (one). The children who felt more popular when speaking "Mandarin" said: he/she felt so because "he/she can use Mandarin when Mandarin-speaking friends visit his/her home" (one response), "he/she can help Chinese people who do not know how to speak English and explain in Mandarin for them" (one), "he/she receives praise from many people when he/she speaks Mandarin" (one), and "all his/her family members, such as grandparents, can understand him/her when speaking Mandarin" (one). The children who felt more popular when speaking "English" explained that "most people know English in Canada" (three responses) and that "he/she speaks more English at school" (one).

The language the children speak when they are happy

Responding to the question "which language do you prefer to speak when you are happy?", more than half the children (37 out of 60) said both "Mandarin and English", and sixteen (out of sixty) reported "English" (see table 4.14). This parameter correlated with two of the proficiency parameters:

- Total number of different nouns, r(60)=0.349, p=0.006; and
- Total number of different final particles, r(60)=0.292, p=0.024.

When the children were happy, they chose to speak both "Mandarin and English" as "he/she can communicate with different people who speak either Mandarin or English" (one response). The children selected "English" because "he/she knows lots of happy words in English" (one response) and "he/she can share with friends and chat with peers who mostly speak English" (one).

The language the children speak when they are sad

In response to the question "which language do you speak when you are sad?", around half the children (31 out of 60) reported both "Mandarin and English", and twenty-one (out of sixty)

indicated “English” (see table 4.14). This parameter correlated with two of the speech proficiency parameters:

- Total number of tone errors, r(60)=-0.260, p=0.045; and
- Average number of words per second (speech rate), r(60)=0.327, p=0.011.

When the children were sad, they preferred “English” because “he/she knows more sad words in English” (one response). As for children who selected “Mandarin”, they explained that “he/she wants to complain to parents” (one response) and “ensure that parents can understand him/her” (one).

The language the children prefer to speak when people speak Mandarin to them

Regarding the question “which language do you prefer to speak when people speak Mandarin to you?”, twenty-six (out of sixty) of the children replied both “Mandarin and English”, twenty-three (out of sixty) answered “Mandarin”, and eleven (out of sixty) reported “English” (see table 4.14). This parameter correlated with the following speech proficiency parameters:

- Total number of Chinese words, r(60)=0.302, p=0.019;
- Total number of different Chinese words (vocabulary size), r(60)=0.258, p=0.047;
- Total number of different final particles, r(60)=0.305, p=0.018;
- Average number of words per sentence (sentence length), r(60)=0.270, p=0.037;
- Total number of grammatical errors, r(60)=-0.263, p=0.043;
- Total number of phonological errors, r(60)=-0.300, p=0.020
- Total number of errors, r(60)=-0.284, p=0.028; and
- Average number of words per second (speech rate), r(60)=0.305, p=0.018.

In addition, a total of sixty of the children replied to the question “when you can respond in Mandarin, how does it make you feel?”, and their answers were “happy” (nineteen responses), “fine” (thirteen), “okay” (nine), “good” (five), “no idea” (five), “normal” (three), “proud” (three), “cool” (two), and “excited” (one).

Whether the children shift to English if they are unable to answer in Mandarin

When asked the question “will you shift to English if you do not know how to reply to a question asked in Mandarin?”, most of the children (52 out of 60) said “no”, and eight (out of sixty) reported “yes”. This parameter correlated with the children’s speech proficiency parameter “total

number of complex and compound sentences", r(60)=0.323, p=0.012.

Whether the children find solutions if they are unable to answer in Mandarin

When asked the question "will you find solutions if you do not know how to reply in Mandarin?", more than half the children (37 out of 60) reported "no", and twenty-three (out of sixty) responded "yes". This parameter correlated with several of the children's speech proficiency parameters:

- Total number of Chinese utterances, r(60)=0.272, p=0.035;
- Total number of different Chinese utterances, r(60)=0.261, p=0.044;
- Total number of sentences, r(60)=0.293, p=0.023; and
- Total number of simple sentences, r(60)=0.337, p=0.008.

The children identified using the following tactics to handle a situation when they did not know how to reply in Mandarin: they "would ask Mandarin-speaking people for help and try to answer in Mandarin" (nine responses), "answer in Mandrin with the support of hand signs and body language" (three), "check an e-dictionary or use google translation to answer in Mandarin" (two), "ask for a repetition" (two), "switch to Chinese dialects, i.e., Cantonese as an extra assistant" (two), "use various ways to answer in Mandarin, such as drawing pictures" (one), and "try harder to learn Mandarin better" (one).

In addition, a total of sixty children replied to the question "when you cannot respond in Mandarin, how does it make you feel?", and their answers were "nothing" (fifteen responses), "okay" (ten), "sad" (nine), "embarrassed" (seven), "shy" (four), "no idea" (three), "bad" (three), "encouraged" (two), "confused" (two), "normal" (two), "difficult" (one), "annoyed" (one), and "nervous" (one).

As seen, these results showed that the children held positive attitudes towards both Mandarin and English, though they felt more confident when speaking English and spoke English more at the time of the study, probably due to attending English-speaking public schools and getting to know more English-speaking peers. It should also be noted that the children's acquisition of different lexical items such as different nouns, verbs, and final particles, their production of different phrases, clauses, sentences (particularly complex sentences), their sentence and utterance length, their speech accuracy in general, their speech rate and speech fluency, and their English code-switches covaried with their language attitudes.

4.4. Sociolinguistic Factors in the Children's Mandarin Heritage Language Maintenance and Proficiency: Language Use and Exposure Parameters

This section explored the parents' and children's language use and the children's linguacultural exposure in the domains of the family and home, the Chinese community, the Mandarin heritage language school, and in China. In addition, it presented the correlations between the sociolinguistic parameters of language use and exposure and the children's Mandarin language proficiency parameters.

4.4.1 Language use and exposure in the family and home (as reported by the parents and children)

Family members

The data here came, in part, from the children's responses to the questions "are you living with other family members at home, i.e., siblings or grandparents?" and "do you have grandparents living in China?" (as noted in table 4.15). The data also came, in part, from the parents' answers to the questions "how often do you take your child to visit their grandparents residing in China?" and "how often do you stay with your child at home?"

Table 4.15

Other family members

(as reported by the children)

Other family members at home/child responses	Yes	No	Total
I have siblings at home	46 (77%)	14 (23%)	60
I am living with my grandparents at home	27 (45%)	33 (55%)	60
I have grandparents residing in China	49 (82%)	11 (18%)	60

Whether the children have siblings at home

Most of the children (46 out of 60) had siblings at home (see table 4.15), but no correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Whether the children are living with their grandparents at home

Among a total of sixty child responses, close to half the children (27 out of 60) lived with their grandparents at home (see table 4.15). This parameter correlated with two of the children's Mandarin speech proficiency parameters:

- Total number of errors, $r(60)=-0.296$, $p=0.022$; and
- Total number of phonological errors, $r(60)=-0.258$, $p=0.046$

It showed that the children were less likely to make errors (particularly phonological errors) if they lived with their grandparents at home.

Whether the children have grandparents residing in China

Most of the children (49 out of 60) had grandparents residing separately in China (see table 4.15). This parameter correlated with three of the speech proficiency parameters:

- Average number of words per utterance (utterance length), $r(60)=0.258$, $p=0.047$;
- Total number of incomplete sentences, $r(60)=-0.314$, $p=0.015$; and
- Average number of pauses per utterance (speech fluency), $r(60)=-0.377$, $p=0.003$.

The results showed that the children produced more complete sentences, longer utterances, and fewer pauses if they had grandparents residing separately in China.

Frequency of the children visiting their grandparents residing in China

The parents (49 out of 60) whose children had grandparents residing in China answered the question "how often do you take your child to visit their grandparents residing in China?". Their responses (n=49) were provided as follows: "always" (n=4, 8%), "often" (n=8, 16%), "sometimes" (n=12, 25%), "rarely" (n=23, 47%), and "never" (n=2, 4%). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese words, $r(49)=-0.414$, $p=0.003$;
- Total number of different Chinese words (vocabulary size), $r(49)=-0.354$, $p=0.013$;
- Total number of Chinese utterances, $r(49)=-0.316$, $p=0.027$;
- Total number of different Chinese utterances, $r(49)=-0.319$, $p=0.026$;
- Total number of different verbs, $r(49)=-0.329$, $p=0.021$;
- Total number of sentences, $r(49)=-0.464$, $p<0.001$;

- Total number of simple sentences, r(49)=-0.388, p=0.006;
- Average number of words per second (speech rate), r(49)=-0.309, p=0.031; and
- Average number of pauses per utterance (speech fluency), r(49)=0.325, p=0.023.

The results showed that the children had a smaller vocabulary, produced fewer sentences (even simple sentences), and commanded a lower speech rate and fluency if they rarely visited their grandparents residing separately in China.

Frequency of the parents staying with their children at home

When asked the question "how often do you stay with your child at home?", most of the parents (46 out of 60) answered "always", and the rest (14 out of 60) reported "often". This parameter correlates with several of the children's speech proficiency parameters:

- Average number of words per utterance (utterance length), r(60)=0.262, p=0.043;
- Total number of different final particles, r(60)=0.297, p=0.021;
- Total number of incomplete sentences, r(60)=-0.267, p=0.039;
- Total number of complex and compound sentences, r(60)=0.310, p=0.016;
- Average number of words per second (speech rate), r(60)=0.338, p=0.008; and
- Length of English code-switches (in words), r(60)=-0.325, p=0.011.

As noted, the results showed that the children acquired more different final particles, produced longer utterances by applying complete and complex sentences, and commanded a higher speech rate and fewer English code-switches if their parents stayed with them at home more often.

Language use among family members at home

All the information here was collected from the parents' and children's responses to questions about the language they usually used with their family members at home.

Parents' language use with family members at home

The parents' reports about their language use with their family members at home were summarized in table 4.16.

Table 4.16

The language usually used by the parents at home

(as reported by the parents)

Parents' language use at home/parent responses	Only Mandarin	Mostly Mandarin	Mandarin and English	Mostly English	Only English	Only Chinese dialect(s)	Total
with my child	14 (23%)	31 (52%)	11 (18%)	0 (0%)	0 (0%)	4 (7%)	60
between my spouse and my child	15 (25%)	33 (55%)	6 (10%)	3 (5%)	0 (0%)	3 (5%)	60
between me and my spouse	35 (58%)	15 (25%)	0 (0%)	2 (3%)	0 (0%)	8 (13%)	60
between me and the child's grandparents	18 (67%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	7 (26%)	27

The language usually used by the parents (mostly mothers) with their children at home

The parents who answered the questionnaire questions were mostly mothers (57 out of 60). When asked the question "which language do you usually speak to your child at home?", thirty-one (out of sixty) of the parents indicated "mostly Mandarin", fourteen (out of sixty) answered "only Mandarin", and eleven (out of sixty) stated both "Mandarin and English" (see table 4.16). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of phrases, $r(60)= 0.326$, $p=0.011$;
- Total number of errors, $r(60)=-0.307$, $p=0.017$;
- Total number of phonological errors, $r(60)=-0.293$, $p=0.023$; and
- Total number of tone errors, $r(60)=-0.322$, $p=0.012$.

The results showed that the children's speech accuracy (particularly phonological accuracy) and number of phrases covaried with their mothers' Mandarin language use at home.

The language usually used by the parents' spouses (mostly fathers) with their children at home

When asked the question "which language does your spouse usually speak to your child at home?", thirty-three (out of sixty) of the parent participants said that their spouse (mostly fathers) spoke "mostly Mandarin" with their children at home, and fifteen (out of sixty) stated "only Mandarin" (see table 4.16). This parameter correlated with some of the children's Mandarin speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.261$, $p=0.044$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.280$, $p=0.030$;
- Total number of different verbs, $r(60)=0.359$, $p=0.005$;
- Total number of different final particles, $r(60)=0.293$, $p=0.023$;
- Total number of phrases, $r(60)=0.263$, $p=0.042$;
- Total number of sentences, $r(60)=0.334$, $p=0.009$;
- Average number of English code-switches per utterance, $r(60)=-0.263$, $p=0.042$; and
- Length of English code-switches (in words), $r(60)=-0.400$, $p=0.002$.

The results demonstrated that the children's acquisition of lexical items, such as different verbs and final particles, their production of phrases and sentences, and fewer shifts to English covaried with their fathers' language use in Mandarin at home.

The language usually used between the parents and their spouses at home

When asked "which language do you and your spouse usually speak to each other at home?", more than half the parents (35 out of 60) indicated "only Mandarin", and fifteen (out of sixty) stated "mostly Mandarin" (see table 4.16). This parameter correlated with several of the Mandarin speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.260$, $p=0.044$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.305$, $p=0.018$;
- Total number of different verbs, $r(60)=0.259$, $p=0.046$;
- Total number of different final particles, $r(60)=0.270$, $p=0.037$;
- Total number of incomplete sentences, $r(60)=-0.321$, $p=0.012$;
- Total number of complex and compound sentences, $r(60)=0.275$, $p=0.034$;
- Average number of English code-switches per utterance, $r(60)=-0.305$, $p=0.018$; and
- Length of English code-switches (in words), $r(60)=-0.439$, $p<0.001$.

The results showed that the children rarely shifted to English in a language environment where their parents spoke Mandarin to each other. In addition, the children used more Mandarin vocabulary and complex sentences if both their parents spoke Mandarin with each other at home.

The language usually used between the parents and the child's grandparents at home

The parents (27 out of 60) whose children had their grandparents at home answered the question "is Mandarin the grandparent's first language?". Most of the parents (16 out of 27) noted "yes", and the rest (11 out of 27) indicated that the child's grandparents spoke Chinese dialects besides Mandarin. The parameter "the first language of the child's grandparents" correlated with the children's speech proficiency parameter "total number of tone errors", $r(27)=-0.399$, $p=0.039$.

In response to the question "which language do you and the child's grandparents usually speak to each other at home?", most of the parents (18 out of 27) said "only Mandarin", and seven (out of twenty-seven) stated "only Chinese dialects" (see table 4.16). No correlations were found between the parameter "the language usually used between the parents and the child's grandparents at home" and the children's Mandarin language proficiency parameters.

Children's language use with family members at home

The children's responses to the language that they usually spoke at home were summarized in table 4.17, and they revealed the language usually used by children at home, the language usually used by children while playing on their own, and the language usually used with family members at home.

Table 4.17

The language usually used by the children at home

(as reported by the children)

Children's language use at home/ child responses	Mandarin	Mandarin and English	English	Only Chinese dialect(s)	Total
by myself at the most of time	21 (35%)	31 (52%)	3 (5%)	5 (8%)	60
by myself while playing on my own	10 (17%)	23 (38%)	23 (38%)	4 (7%)	60
with my mother	34 (57%)	14 (23%)	10 (17%)	2 (3%)	60

with my father	26 (44%)	24 (40%)	5 (8%)	5 (8%)	60
between me and my siblings	15 (33%)	11 (24%)	19 (41%)	1 (2%)	46
between me and my grandparents	24 (89%)	0 (0%)	0 (0%)	3 (11%)	27

The language usually used by the children at home

When asked the question "which language do you usually speak at home?", around half the children (31 out of 60) stated both "Mandarin and English", and twenty-one (out of sixty) answered "Mandarin" (see table 4.17). This parameter correlated with the following children's Mandarin speech proficiency parameters:

- Total number of Chinese words, r(60)=0.349, p=0.006;
- Total number of different Chinese words (vocabulary size), r(60)=0.325, p=0.011;
- Total number of different final particles, r(60)=0.323, p=0.012;
- Total number of sentences, r(60)=0.278, p=0.032;
- Average number of words per second (speech rate), r(60)=0.321, p=0.012; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.339, p=0.008.

The results indicated that the children's Mandarin speech proficiency parameters, such as their acquisition of distinct words, their production of sentences, and their speech rate and speech fluency covaried with the frequency of Mandarin language use at home.

The language usually used by the children while playing on their own at home.

When asked the question "which language do you usually speak when you play on your own at home?", an equal number of the children (23 out of 60) said both "Mandarin and English" and "English", and ten (out of sixty) stated "Mandarin" (see table 4.17). This parameter correlated with the following children's Mandarin language proficiency parameters:

- Average number of words per utterance (utterance length), r(60)=0.259, p=0.045;
- Average number of pauses per utterance (speech fluency), r(60)=-0.290, p=0.025;
- Total number of grammatical errors, r(60)=-0.265, p=0.041;
- Average number of English code-switches per utterance, r(60)=-0.316, p=0.014;
- Length of English code-switches (in words), r(60)=-0.281, p=0.030;
- Total number of different Chinese characters written, r(60)=-0.254, p=0.050; and
- Total number of correct Chinese characters written, r(60)=-0.257, p=0.048.

It appeared that the children's ability to write Chinese characters was more likely to be lower if they spoke English while playing on their own at home, whereas they produced a higher number of longer utterances, had fewer grammatical errors, made fewer English code-switches, and had a higher speech fluency if they spoke Mandarin more often.

The language usually used by the children with their mothers at home

When asked the question "which language do you usually speak to your mother at home?", more than half the children (34 out of 60) answered "Mandarin", and fourteen (out of sixty) replied both "Mandarin and English" (see table 4.17). This parameter correlated with several of the speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.378, p=0.003;
- Average number of words per utterance (utterance length), r(60)=0.303, p=0.019;
- Total number of different verbs, r(60)=0.386, p=0.002;
- Total number of different final particles, r(60)=0.328, p=0.011;
- Total number of different grammatical particles, r(60)=0.274, p=0.034;
- Total number of incomplete sentences, r(60)=-0.318, p=0.013;
- Total number of errors, r(60)=-0.260, p=0.045;
- Total number of phonological errors, r(60)=-0.296, p=0.022;
- Total number of tone errors, r(60)=-0.271, p=0.036;
- Average number of words per second (speech rate), r(60)=0.380, p=0.003;
- Average number of English code-switches per utterance, r(60)=-0.372, p=0.003; and
- Length of English code-switches (in words), r(60)=-0.361, p=0.005.

The results demonstrated that the children's Mandarin speech proficiency, especially a larger vocabulary size, higher speech accuracy and speech rate, and fewer English code-switches, covaried with the use of Mandarin between mothers and children at home.

The language usually used by the children with their fathers at home

When asked the question "which language do you usually speak to your father at home?", twenty-six (out of sixty) of the children answered "Mandarin", and twenty-four (out of sixty) reported both "Mandarin and English" (see table 4.17). This parameter correlated with several of the speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.482$, $p<0.001$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.503$, $p<0.001$;
- Total number of Chinese utterances, $r(60)=0.283$, $p=0.028$;
- Total number of different Chinese utterances, $r(60)=0.259$, $p=0.046$;
- Average number of words per utterance (utterance length), $r(60)=0.282$, $p=0.029$;
- Total number of different nouns, $r(60)=0.340$, $p=0.008$;
- Total number of different verbs, $r(60)=0.332$, $p=0.010$;
- Total number of different final particles, $r(60)=0.372$, $p=0.003$;
- Total number of complex and compound sentences, $r(60)=0.302$, $p=0.019$;
- Average number of words per sentence (sentence length), $r(60)=0.353$, $p=0.006$; and
- Average number of words per second (speech rate), $r(60)=0.314$, $p=0.014$.

The results showed that the children attained a larger number of different lexical items, produced more varied, longer, and structurally complex utterances, and had a higher speech rate if they spoke Mandarin with their fathers at home.

The language usually used between the children and their siblings at home

The children (46 out of 60) who had siblings at home answered the question "which language do you and your siblings usually speak to each other at home?". Nineteen (out of forty-six) of the children indicated "English", fifteen (out of forty-six) stated "Mandarin", and eleven (out of forty-six) said both "Mandarin and English" (see table 4.17). This parameter correlated with the following speech proficiency parameters:

- Average number of words per utterance (utterance length), $r(46)=0.293$, $p=0.048$;
- Total number of different nouns, $r(46)=0.295$, $p=0.046$;
- Total number of different grammatical particles, $r(46)=0.354$, $p=0.016$;
- Total number of grammatical errors, $r(46)=-0.307$, $p=0.038$;
- Average number of English code-switches per utterance, $r(46)=-0.397$, $p=0.006$;
- Total number of English code-switches (in words), $r(46)=-0.395$, $p=0.007$;
- Total number of Chinese characters written, $r(46)=-0.418$, $p=0.004$;
- Total number of different Chinese characters written, $r(46)=-0.358$, $p=0.015$;
- Total number of correct Chinese characters written, $r(46)=-0.347$, $p=0.018$.

The results indicated that the children who spoke more Mandarin with their siblings were

more likely to achieve a larger vocabulary size, use longer utterances, and make fewer grammatical errors and English code-switches. It was also noteworthy that children who spoke more English at home were less successful at writing Chinese characters.

The language usually used between the children and their grandparents at home

The children (27 out of 60) who had grandparents at home responded to the question "which language do you and your grandparents usually speak to each other at home?". Most of the children (24 out of 27) answered "Mandarin", and the other three replied "only Chinese dialects" (see table 4.17). However, no correlations were found between this parameter and the children's Mandarin language proficiency parameters.

This lack of covariance between the language used by the child's grandparents and the children's Mandarin language proficiency could probably be explained by the relatively short periods of time the grandparents stayed with their families, as they generally only stayed with the families for six months to a year due to the restrictions on visitor visas in Canada.

Language use among family members outside the home

The data reported here came from the parents' answers about language use by family members outside the home, as noted in table 4.18.

Table 4.18

The language usually used among family members outside the home (as reported by the parents)

Language use among family members outside home/parent responses	Only Mandarin	Mostly Mandarin	Mandarin and English	Mostly English	Only English	Only Chinese dialect(s)	Total
between me and my child	3 (5%)	23 (38%)	12 (20%)	17 (29%)	3 (5%)	2 (3%)	60
between my spouse and child	6 (10%)	30 (50%)	13 (22%)	6 (10%)	2 (3%)	3 (5%)	60

between my child and his/her siblings	5 (11%)	7 (15%)	8 (17%)	20 (44%)	5 (11%)	1 (2%)	46
between my child and his/her grandparents living at home	23 (85%)	1 (4%)	0 (0%)	0 (0%)	0 (0%)	3 (11%)	27
between my child and his/her grandparents living in China	36 (73%)	8 (17%)	0 (0%)	0 (0%)	0 (0%)	5 (10%)	49

The language usually used between the parents (mostly mothers) and their children outside the home

The parent participants (mostly mothers) answered the question "which language do you and your child usually speak with each other outside the home?": twenty-three (out of sixty) of them stated "mostly Mandarin", seventeen (out of sixty) said "mostly English", and twelve (out of sixty) indicated both "Mandarin and English" (see table 4.18). This parameter correlated with many of the children's Mandarin speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.327, p=0.011;
- Total number of different nouns, r(60)=0.284, p=0.028;
- Total number of different final particles, r(60)=0.328, p=0.011;
- Average number of words per utterance (utterance length), r(60)=0.331, p=0.010;
- Average number of words per sentence (sentence length), r(60)=0.274, p=0.034;
- Total number of incomplete sentences, r(60)=-0.316, p=0.014;
- Total number of errors, r(60)=-0.351, p=0.006;
- Total number of phonological errors, r(60)=-0.290, p=0.025;
- Total number of tone errors, r(60)=-0.339, p=0.008;
- Total number of segmental errors, r(60)=-0.280, p=0.030;
- Total number of grammatical errors, r(60)=-0.322, p=0.012;
- Average number of English code-switches per utterance, r(60)=-0.302, p=0.019; and

- Length of English code-switches (in words), r(60)=-0.323, p=0.012.

It appeared that the children attained a larger vocabulary with different lexical items, spoke more complete and longer sentences and utterances, made fewer errors overall, in particular, phonological and grammatical errors, and produced fewer English code-switches if Mandarin was usually used between the children and mothers outside the home.

The language usually used between the parents' spouses (mostly fathers) and their children outside the home

In response to the question "which language do your spouse and your child usually speak with each other outside the home?", half the parents (30 out of 60) answered that their spouse (mostly fathers) and children spoke "mostly Mandarin" outside the home, and thirteen (out of sixty) indicated both "Mandarin and English" (see table 4.18). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of Chinese words, r(60)=0.352, p=0.006;
- Total number of different Chinese words (vocabulary size), r(60)=0.415, p<0.001;
- Total number of different verbs, r(60)=0.328, p=0.011;
- Total number of different final particles, r(60)=0.332, p=0.010;
- Average number of words per utterance (utterance length), r(60)=0.289, p=0.025;
- Total number of sentences, r(60)=0.351, p=0.006;
- Total number of simple sentences, r(60)=0.378, p=0.003;
- Total number of errors, r(60)=-0.334, p=0.009;
- Average number of words per second (speech rate), r(60)=0.280, p=0.030; and
- Length of English code-switches (in words), r(60)=-0.281, p=0.029.

The results demonstrated that the children's production of vocabulary, sentences and utterances, and speech rate were all higher, while the number of errors and English code-switches were lower, if the children and their fathers used more Mandarin outside the home.

The language usually used between the children and their siblings outside the home

The parents (46 out of 60) whose children had siblings answered the question "which language do your child and his/her siblings usually speak with each other outside the home?". Twenty (out of forty-six) of the parents stated "mostly English", eight (out of forty-six) reported

both “Mandarin and English”, and twelve (out of forty-six) indicated “Mandarin”. Within the latter group of 12 parents, seven parents mentioned “mostly Mandarin” and five “only Mandarin” (see table 4.18). This parameter correlated with a few of the children’s language proficiency parameters:

- Total number of errors, r(46)=-0.361, p=0.014;
- Total number of grammatical errors, r(46)=-0.411, p=0.004;
- Total number of phonological errors, r(46)=-0.305, p=0.039;
- Total number of tone errors, r(46)=-0.336, p=0.022;
- Average number of English code-switches per utterance, r(46)=-0.327, p=0.026;
- Length of English code-switches (in words), r(46)=-0.340, p=0.021;
- Total number of Chinese characters written, r(46)=-0.319, p=0.031;
- Total number of different Chinese characters written, r(46)=-0.292, p=0.049; and
- Total number of correct Chinese characters written, r(46)=-0.301, p=0.042.

As seen, it appeared that the children’s speech accuracy increased while the number of English code-switches decreased if the children spoke more Mandarin with their siblings outside the home. The results also showed that the children’s ability to write Chinese characters was lower if English was used more often between the children and their siblings outside the home.

The language usually used between the children and their grandparents (who live together at home) outside the home

The parents (27 out of 60) whose children had grandparents at home responded to the question “which language do your child and the child’s grandparents (who live together at home) usually speak with each other outside the home?”. Most of the parents (23 out of 27) indicated “only Mandarin” (see table 4.18). No correlations were detected between this parameter and the children’s Mandarin language proficiency parameters.

The language usually used between the children and their grandparents (who live separately in China)

The parents (49 out of 60) whose children had grandparents living separately in China replied to the question “which language do your child and his/her grandparents (who live in China) usually speak with each other, while calling or visiting them in China?”. Most of the parents (36 out of 49) said “only Mandarin”, and eight (out of forty-nine) stated “mostly Mandarin” (see table

4.18). This parameter correlated with the speech proficiency parameter "total number of different verbs", r(49)=0.292, p=0.042.

The results did not contain many correlations between the language used by the child's grandparents (whether they lived together at home or separately in China) and the children's Mandarin language proficiency, probably because children spent more time communicating with their parents than with their grandparents.

Children's linguacultural exposure at home

Data about the children's linguacultural exposure at home was collected from the responses provided by the parents and children, and it included Mandarin media at home, the parents' explicit Mandarin language teaching, and Chinese language and culture practices in Mandarin at home.

Children's exposure to Mandarin media at home

The effects of Mandarin media, such as Mandarin TV, movies, animations, songs, radio, websites, computer games, and phone-calls, were presented in this section. The children's exposure to Mandarin media at home as reported by the children was extracted from their interview responses (via yes/no questions, as shown in table 4.19), and the frequency of the children's exposure to Mandarin media at home was extracted from the parents' questionnaire responses on a Likert scale that included "always", "often", "sometimes", "rarely", and "never" (as presented in table 4.20).

Table 4.19

Children's exposure to Mandarin media at home

(as reported by the children)

Mandarin media exposure/child responses	Yes	No	Total
Mandarin TV channels	43 (72%)	17 (28%)	60
Mandarin movies	30 (50%)	30 (50%)	60
Mandarin animations	44 (73%)	16 (27%)	60
Mandarin songs	49 (82%)	11 (18%)	60
Mandarin radio channels	13 (22%)	47 (78%)	60
Chinese websites	12 (20%)	48 (80%)	60

Mandarin computer games	29 (48%)	31 (52%)	60
Phone-calls in Mandarin	50 (83%)	10 (17%)	60

Table 4.20

Frequency of the children's exposure to Mandarin media at home (as reported by the parents)

Frequency of the children's exposure to Mandarin media/parent responses	Always	Often	Some-times	Rarely	Never	Total
Mandarin TV	3 (5%)	19 (32%)	17 (28%)	14 (23%)	7 (12%)	60
Mandarin movies	0 (0%)	10 (17%)	20 (33%)	22 (37%)	8 (13%)	60
Mandarin animations	3 (5%)	15 (25%)	20 (33%)	18 (30%)	4 (7%)	60
Mandarin songs	0 (0%)	9 (15%)	28 (47%)	16 (27%)	7 (11%)	60
Mandarin radio	0 (0%)	3 (5%)	6 (10%)	16 (27%)	35 (58%)	60
Chinese websites	0 (0%)	7 (13%)	4 (7%)	31 (50%)	18 (30%)	60
Mandarin computer games	0 (0%)	2 (3%)	7 (12%)	20 (33%)	31 (52%)	60
Phone-calls in Mandarin	11 (18%)	18 (30%)	13 (22%)	11(18%)	7 (12%)	60

Children's exposure to Mandarin TV channels at home

More than half the children (43 out of 60) watched Mandarin TV channels at home (see table 4.19), such as "I am a speaker/我是演说家", "I am a singer/我是歌手", "Pleasant goat and big wolf/喜羊羊与灰太狼", "If you are the one/非诚勿扰", or "Dream speaker/梦想演说家" . This parameter correlated with a few of the children's speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.298, p=0.021;
- Total number of different nouns, r(60)=0.301, p=0.020; and
- Average number of words per utterance (utterance length), r(60)=0.272, p=0.035.

Frequency of the children watching Mandarin TV channels at home

In response to the question "how often does your child watch Mandarin TV channels at home?", nineteen (out of sixty) of the parents stated "often", seventeen (out of sixty) answered "sometimes", and fourteen (out of sixty) said "rarely" (see table 4.20). This parameter correlated

with some of the speech proficiency parameters:

- Total number of different final particles, r(60)=0.291, p=0.024;
- Total number of clauses, r(60)=0.263, p=0.042;
- Average number of English code-switches per utterance, r(60)=-0.261, p=0.044; and
- Length of English code-switches (in words), r(60)=-0.354, p=0.006.

The results indicated that the children obtained varied lexical items, such as different nouns and final particles, produced longer utterances with clauses, and rarely shifted to English, if they usually watched Mandarin TV channels at home.

Children's exposure to Mandarin movies at home

Half the children (30 out of 60) watched Mandarin movies at home (see table 4.19), such as "My father-in-law/我的岳父大人", "Lost on journey/人在囧途", "Chinese zodiac/十二生肖", or "Pleasant goat and big wolf/喜羊羊与灰太狼". This parameter correlated with three of the Mandarin speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.304, p=0.018;
- Total number of different verbs, r(60)=0.257, p=0.047; and
- Total number of different nouns, r(60)=0.261, p=0.044.

Frequency of the children watching Mandarin movies at home

When asked the question "how often does your child watch Mandarin movies at home?", twenty-two (out of sixty) of the parents answered "rarely", twenty (out of sixty) stated "sometimes", and ten (out of sixty) replied "often" (see table 4.20). This parameter correlated with two of the speech proficiency parameters:

- Total number of different classifiers, r(60)=-0.286, p=0.027; and
- Total number of Chinese utterances, r(60)=-0.254, p=0.050.

The results showed that the children acquired more varied lexical items, such as diverse nouns and verbs, if they watched Mandarin movies at home. On the other hand, not watching Mandarin movies often was associated with the production of fewer classifiers and utterances.

Children's exposure to Mandarin animations at home

Most of the children (44 out of 60) watched Mandarin animations at home (see table 4.19),

such as “Qiaohu/巧虎”, “Doraemon/哆啦 A 梦”, “G G Bond/猪猪侠”, “Pleasant goat and big wolf/喜羊羊与灰太狼”, “The mermaid/美人鱼”, “Snow white/白雪公主”, “Bob the builder/巴布工程师”, “Black cat detective/黑猫警长”, “The adventures of little carp/小鲤鱼”, “Big-headed kid and small-headed dad/大头儿子小头爸爸”, “Journey to the west/西游记”, “Boonie bears/熊出没”, “Tom and Jerry/猫和老鼠”, or “Cartoons series of Shanghai animation film studio/上海美术电影制片厂的系列动画片”. This parameter correlated with the following children’s Mandarin language proficiency parameters:

- Total number of Chinese words, r(60)=0.326, p=0.011;
- Total number of different Chinese words (vocabulary size), r(60)=0.339; 0=0.008;
- Total number of different nouns, r(60)=0.279, p=0.031;
- Total number of different final particles, r(60)=0.331, p=0.010;
- Total number of Chinese utterances, r(60)=0.315, p=0.014;
- Total number of different Chinese utterances, r(60)=0.293, p=0.023;
- Total number of lexical errors, r(60)=0.282, p=0.029; and
- Total number of different Chinese characters written, r(60)=0.259, p=0.045.

Frequency of the children watching Mandarin animations at home

When asked the question “how often does your child watch Mandarin animations at home?”, twenty (out of sixty) of the parents responded “sometimes”, eighteen (out of sixty) stated “rarely”, and fifteen (out of sixty) reported “often” (see table 4.20). This parameter correlated with some of the children’s speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.274, p=0.034;
- Total number of different final particles, r(60)=0.268, p=0.039;
- Average number of words per second (speech rate), r(60)=0.312, p=0.015;
- Average number of pauses per utterance (speech fluency), r(60)=-0.281, p=0.029;
- Average number of English code-switches per utterance, r(60)=-0.368, p=0.004; and
- Length of English code-switches (in words), r(60)=-0.388, p=0.002.

It appeared that watching Mandarin animations at home might enhance the children’s vocabulary development and reduce code-switches to English, likely because the language used in animations was simplified and children could comprehend it more easily. The children in the study,

therefore, could probably identify some Chinese characters from the subtitles in the animations, yet as lexical items from animations sometimes were not applicable to everyday speech, they might make more lexical errors if they used lexical items inaccurately learned from animations. For example, the word "死/dead" is used sometimes as a 'joke' word to describe the situation of losing control, as in the example "我累的要死了/I am almost dying as I am too tired"; however, this word is not normally used in everyday speech because it sounds abnormal and Chinese people avoid using it most of the time.

Children's exposure to Mandarin songs at home

Forty-nine (out of sixty) of the children listened to Mandarin songs (see table 4.19) at home, such as "Mandarin pop songs (i.e., super star by SHE)", "Mandarin nursery rhymes (i.e., spring sleep do not feel dawn/春眠不觉晓)", "Little apple/小苹果", "Two tigers/两只老虎", "Number the stars/数星星", "Congratulations/恭喜恭喜", or "Catch the eels/捉泥鳅". This parameter correlated with the Mandarin speech proficiency parameter "total number of different final particles", r(60)=0.292, p=0.024.

Frequency of the children listening to Mandarin songs at home

When asked the question "how often does your child listen to Mandarin songs at home?", twenty-eight (out of sixty) of the parents indicated "sometimes", and sixteen (out of sixty) replied "rarely" (see table 4.20). This parameter correlated with the speech proficiency parameter "length of English code-switches (in words)", r(60)=-0.255, p=0.050.

Listening to Mandarin songs increased the children's acquisition of different final particles, and it also created a richer cultural environment where children felt more motivated to adhere to Mandarin and did not code-switch to English.

Children's exposure to Mandarin radio channels at home

Most of the children (47 out of 60) did not listen to Mandarin radio channels at home, and the other thirteen children did (see table 4.19). No correlations were found between this parameter and the Mandarin language proficiency parameters.

Frequency of the children listening to Mandarin radio channels at home

In response to the question "how often does your child listen to Mandarin radio channels at home?", thirty-five (out of sixty) of the parents stated "never", and sixteen (out of sixty) said "rarely" (see table 4.20). This parameter correlated with the speech proficiency parameter "total number of clauses", $r(60)=0.257$, $p=0.047$.

Nearly no correlations were found between the children's exposure to Mandarin radio channels at home and their Mandarin language proficiency parameters, probably due to the limited number of the children who listened to Mandarin radio channels at home. It was worth noting that the children's number of clauses the children used in sentences covaried with their exposure to Mandarin radio channels.

Children's exposure to Chinese websites at home.

Most of the children (48 out of 60) did not browse Chinese websites at home, and the other twelve children did (see table 4.19). This parameter correlated with a few of the Mandarin language proficiency parameters:

- Total number of different Chinese characters written, $r(60)=0.289$, $p=0.025$; and
- Total number of correct Chinese characters written, $r(60)=0.286$, $p=0.027$.

Frequency of the children browsing Chinese websites at home

In response to the question "how often does your child browse Chinese websites at home", around half the parents (31 out of 60) stated "rarely", and eighteen (out of sixty) said "never" (see table 4.20). This parameter correlated with the speech proficiency parameter "total number of errors", $r(60)=-0.260$, $p=0.045$.

The results indicated that browsing Chinese websites contributed to the children's language use accuracy and promoted their abilities to identify and write Chinese characters and words.

Children's exposure to Mandarin computer games at home

Twenty-nine (out of sixty) of the children played Mandarin computer games at home (see table 4.19). This parameter correlated with two of the Mandarin speech proficiency parameters:

- Total number of different final particles, $r(60)=0.347$, $p=0.007$; and
- Total number of segmental errors, $r(60)=0.272$, $p=0.036$.

Frequency of the children playing Mandarin computer games at home

Regarding the question "how often does your child play Mandarin computer games at home?", around half the parents (31 out of 60) stated "never", and twenty (out of sixty) said "rarely" (see table 4.20). No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

It appeared that the children were better at using final particles if they played Mandarin computer games at home. This could be explained by the frequent use of final particles in the videogame speech. For instance, when the game was over, the game player would say "输了/lose the game" or "没了 or 完了(both means game over)" in Mandarin, so the final particles "了" was used often. However, the children's segmental errors correlated with their exposure to Mandarin computer games, probably because Mandarin was not pronounced in a standard way in computer games for the purpose of recreation.

Children's exposure to phone-calls in Mandarin

Most of the children (50 out of 60) made phone calls in Mandarin at home (see table 4.19). This parameter correlated with some of the children's Mandarin speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.276$, $p=0.033$;
- Total number of Chinese utterances, $r(60)=0.258$, $p=0.046$;
- Total number of different Chinese utterances, $r(60)=0.274$, $p=0.034$;
- Total number of sentences, $r(60)=0.422$, $p<0.001$;
- Total number of simple sentences, $r(60)=0.410$, $p<0.001$;
- Average number of words per second (speech rate), $r(60)=0.258$, $p=0.047$; and
- Average number of pauses per utterance (speech fluency), $r(60)=-0.264$, $p=0.042$.

Frequency of the children making phone-calls in Mandarin at home

When asked the question "how often does your child make phone calls in Mandarin at home?", eighteen (out of sixty) of the parents indicated "often", thirteen (out of sixty) reported "sometimes", and an equal number (11 out of 60) responded "always" and "rarely" (see table 4.20). This parameter correlated with two of the children's speech proficiency parameters:

- Total number of different final particles, $r(60)=0.392$, $p=0.002$; and

- Total number of phrases, r(60)=0.305, p=0.018.

The results suggested that the children were more likely to acquire a larger number of Chinese words, such as a higher number of final particles and phrases, produce more simple sentences, and develop a higher speech rate and fluency if they frequently made phone calls in Mandarin at home.

Children's exposure to explicit Mandarin language teaching at home

The parents' reports about their explicit Mandarin language teaching (such as listening, speaking, reading, and writing) at home were listed in table 4.21, and the children's responses to their frequency of practising those Mandarin linguistic skills were displayed in table 4.22.

Table 4.21

Frequency of the parents' explicit language teaching at home

(as reported by the parents)

Parents' explicit Mandarin language teaching at home/parent responses	Always	Often	Sometimes	Rarely	Never	Total
teaching child listening	12 (20%)	29 (48%)	12 (20%)	6 (10%)	1 (2%)	60
teaching child speaking	20 (33%)	30 (50%)	9 (15%)	1 (2%)	0 (0%)	60
teaching child reading	8 (13%)	25 (42%)	14 (24%)	8 (13%)	5 (8%)	60
teaching child writing	4 (7%)	22 (37%)	24 (40%)	7 (12%)	3 (4%)	60

Table 4.22

Frequency of the children's practices in Mandarin linguistics skills at home

(as reported the by children)

Children's practices in Mandarin linguistic skills at home/child responses	All day	More than half a day	Half a day	Less than half a day	1-2 hours a day	<1 hour a day	Never	Total
practising listening	11 (18%)	13 (22%)	16 (27%)	5 (8%)	9 (15%)	6 (10%)	0 (0%)	60

practising speaking	10 (16%)	11 (18%)	18 (30%)	7 (12%)	7 (12%)	7 (12%)	0 (0%)	60
practising reading	0 (0%)	2 (3%)	1 (2%)	3 (5%)	6 (10%)	24 (40%)	24 (40%)	60
practising writing	0 (0%)	1 (2%)	1 (2%)	0 (0%)	5 (8%)	32 (53%)	21 (35%)	60

Frequency of the parents teaching their children Mandarin listening at home

In response to the question "how often do you teach your child Mandarin listening at home?", twenty-nine (out of sixty) of the parents reported "often", and the responses of "always" and "sometimes" were provided by an equal number of the parents (12 out of 60) (see table 4.21). This parameter correlated with the speech proficiency parameter "total number of different grammatical particles", $r(60)=0.266$, $p=0.040$.

Frequency of the children practising Mandarin listening at home

Responding to the question "how many hours do you usually spend practising Mandarin listening at home?", sixteen (out of sixty) of the children indicated "half a day", thirteen (out of sixty) answered "more than half a day", and eleven (out of sixty) reported "all day" (see table 4.22). For instance, the children listened to their parents who spoke to them in Mandarin or they listened to the Mandarin conversations between their parents. They also said that listening comprehension tasks were given by their parents at home, e.g., they were asked to summarize stories in Mandarin that their parents told them in Mandarin, such as the Aesop's fable Crow Drink Water/乌鸦取水. This parameter correlated with a few of the children's speech proficiency parameters:

- Total number of different verbs, $r(60)=0.268$, $p=0.038$; and
- Total number of different final particles, $r(60)=0.335$, $p=0.009$.

It appeared that the children were more likely to attain a variety of lexical items, such as different verbs, final particles, and grammatical particles, if Mandarin listening was more often taught by their parents and practised by the children at home.

Frequency of the parents teaching their children Mandarin speaking at home

When asked the question "how often do you teach your child Mandarin speaking at home?",

thirty (out of sixty) of the parents replied “often”, and twenty (out of sixty) said “always” (see table 4.21). This parameter correlated with several of the children’s speech proficiency parameters:

- Total number of different nouns, $r(60)=0.276$, $p=0.033$;
- Total number of different final particles, $r(60)=0.291$, $p=0.024$;
- Total number of incomplete sentences, $r(60)=-0.263$, $p=0.042$;
- Average number of words per second (speech rate), $r(60)=0.291$, $p=0.024$;
- Average number of English code-switches per utterance, $r(60)=-0.414$, $p<0.001$; and
- Length of English code-switches (in words), $r(60)=-0.387$, $p=0.002$.

Frequency of the children practising Mandarin speaking at home

In response to the question “how many hours do you usually spend practising Mandarin speaking at home?”, eighteen (out of sixty) of the children stated “half a day”, eleven (out of sixty) said “more than half a day”, and ten (out of sixty) replied “all day” (see table 4.22). This parameter correlated with three of the speech proficiency parameters:

- Total number of different final particles, $r(60)=0.292$, $p=0.023$;
- Average number of words per second (speech rate), $r(60)=0.305$, $p=0.018$; and
- Average number of pauses per utterance (speech fluency), $r(60)=-0.292$, $p=0.024$.

The results showed that the children obtained varied Chinese vocabulary, such as different nouns and final particles, and attained higher speech rate and better speech fluency if Mandarin speaking was taught by their parents and practised at home. In addition, the children produced more complete sentences and fewer English code-switches in their speech if their parents regularly taught them Mandarin speaking at home.

Frequency of the parents teaching their children Mandarin reading at home

When asked the question “how often do you teach your child Mandarin reading at home?”, twenty-five (out of sixty) of the parents said “often”, and fourteen (out of sixty) stated “sometimes” (see table 4.21). Paradoxically, no correlations were seen between this parameter and the children’s Mandarin language proficiency parameters.

Frequency of the children practising Mandarin reading at home

In response to the question “how many hours do you usually spend practising Mandarin

reading at home?", an equal number of the children (24 out of 60) stated "less than one hour a day" and "never" (see table 4.22). This parameter correlated with multiple children's Mandarin language proficiency parameters:

- Total number of Chinese words, $r(60)=0.272$, $p=0.036$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.257$, $p=0.047$;
- Total number of different verbs, $r(60)=0.384$, $p=0.002$;
- Total number of different final particles, $r(60)=0.293$, $p=0.023$;
- Average number of words per total seconds (speech rate), $r(60)=0.403$, $p<0.001$;
- Total number of Chinese characters written, $r(60)=0.291$, $p=0.024$;
- Total number of different Chinese characters written, $r(60)=0.278$, $p=0.031$; and
- Total number of correct Chinese characters written, $r(60)=0.270$, $p=0.037$.

By practising Mandarin reading daily at home, the children might have gained opportunities to increase their vocabulary with diverse lexical items, such as different verbs and final particles, their speech rate, and their ability to write more different and correct Chinese characters.

Frequency of the parents teaching Chinese writing at home

Responding to the question "how often do you teach your child Chinese writing at home?", twenty-four (out of sixty) of the parents replied "sometimes", and twenty-two (out of sixty) said "often" (see table 4.21). However, no correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Frequency of the children practising Chinese writing at home

When asked the question "how many hours do you usually spend practising Chinese writing at home?", thirty-two (out of sixty) of the children answered "less than one hour a day", and twenty-one (out of sixty) reported "never" (see table 4.22). This parameter correlated with a few of the children's Mandarin language proficiency parameters:

- Total number of different verbs, $r(60)=0.258$, $p=0.046$;
- Total number of Chinese characters written, $r(60)=0.323$, $p=0.012$;
- Total number of different Chinese characters written, $r(60)=0.316$, $p=0.014$; and
- Total number of correct Chinese characters written, $r(60)=0.264$, $p=0.041$.

The results demonstrated that the children were more likely to write a larger number of

Chinese characters with higher accuracy, and attain more verbal vocabulary if Chinese writing was practised daily by the children at home, even if was “less than one hour a day”.

In sum, the children were mostly exposed to listening and speaking Mandarin at home, and this exposure ranged from “all day” to “half a day”. In contrast, they were rarely (usually “less than one hour a day”) exposed to Mandarin reading and Chinese writing at home.

Children’s exposure to Chinese language and culture practices in Mandarin at home

The parents’ reports about their Chinese language and culture practices with their children at home were summarized in table 4.23. The children’s responses to their engagement in Chinese language and culture practices at home were listed in table 4.24.

Table 4.23

Parents’ Chinese language and culture practices at home

(as reported by the parents)

Parents’ Chinese language and culture practices at home/parent responses	Always	Often	Some-times	Rarely	Never	Total
reading Chinese story/fairytale books with child	19 (32%)	23 (38%)	10 (17%)	8 (13%)	0 (0%)	60
reading Chinese textbooks with child	18 (30%)	30 (50%)	8 (13%)	4 (7%)	0 (0%)	60
teaching child Chinese literatures such as poems	2 (3%)	16 (27%)	27 (45%)	12 (20%)	3 (5%)	60
holding Chinese cultural activities with child	3 (5%)	22 (37%)	31 (35%)	12 (20%)	2 (3%)	60
playing Chinese games with child	24 (40%)	28 (46%)	4 (7%)	4 (7%)	0 (0%)	60
celebrating Chinese traditional festivals with child	28 (47%)	24 (40%)	5 (8%)	3 (5%)	0 (0%)	60
assisting child with his/her Mandarin language	7 (12%)	23 (38%)	9 (15%)	8 (13%)	13 (22%)	60

assignments						
encouraging child to call Mandarin-speaking relatives	7 (12%)	28 (46%)	15 (25%)	7 (12%)	3 (5%)	60
encouraging child to speak Mandarin	23 (38%)	30 (50%)	6 (10%)	1 (2%)	0 (0%)	60
praising child in Mandarin	23 (38%)	31 (52%)	4 (7%)	2 (3%)	0 (0%)	60
disciplining child in Mandarin	22 (36%)	28 (47%)	7 (12%)	3 (5%)	0 (0%)	60
instructing child in Mandarin	19 (32%)	32 (53%)	7 (12%)	2 (3%)	0 (0%)	60

Table 4.24

Children's engagement in Mandarin-related practices at home (as reported by the children)

Children's engagement in Chinese language and culture practices at home/child responses	Yes	No	Total
reading Chinese storybooks or fairytale books	37 (62%)	23 (38%)	60
reading Chinese textbooks	42 (70%)	18 (30%)	60
learning Chinese idioms	18 (30%)	42 (70%)	60
learning Chinese proverbs	7 (12%)	53 (88%)	60
practising Chinese literatures such as poems	38 (63%)	22 (37%)	60
engaging in Chinese cultural activities	49 (82%)	11 (18%)	60
playing Chinese games	49 (82%)	11 (18%)	60
celebrating Chinese festivals	57 (95%)	3 (5%)	60
writing Mandarin language assignments	39 (65%)	21 (35%)	60
calling Mandarin-speaking relatives	53 (88%)	7 (12%)	60

Frequency of the parents reading Chinese storybooks or fairytale books with their children at home

In response to the question "how often do you read Chinese storybooks or fairytale books

with your child at home?", twenty-three (out of sixty) of the parents said "often", nineteen (out of sixty) stated "always", and ten (out of sixty) indicated "sometimes" (see table 4.23). This parameter correlated with many of the children's speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.263, p=0.042;
- Total number of different verbs, r(60)=0.281, p=0.029;
- Total number of clauses, r(60)=0.348, p=0.006;
- Total number of errors, r(60)=-0.301, p=0.019;
- Total number of phonological errors, r(60)=-0.347, p=0.007;
- Total number of tone errors, r(60)=-0.418, p<0.001;
- Average number of words per second (speech rate), r(60)=0.395, p=0.002;
- Average number of pauses per utterance (speech fluency), r(60)=-0.292, p=0.024;
- Average number of English code-switches per utterance, r(60)=-0.390, p=0.002; and
- Length of English code-switches (in words), r(60)=-0.339, p=0.008.

Children's engagement with reading Chinese storybooks or fairytale books at home

More than half the children (37 out of 60) reported that they read Chinese storybooks or fairytale books at home (see table 4.24), such as "Cinderella/灰姑凉", "The ugly duckling/丑小鸭", "Three sheep/三只羊", "Series of stories from Grimm's and Andersen's fairytales/格林童话故事与安徒生童话故事", "One hundred thousand whys/十万个为什么", or "Krtek/小鼹鼠". This parameter correlated with the following children's speech proficiency parameters:

- Total number of Chinese words, r(60)=0.320, p=0.013;
- Total number of different Chinese words (vocabulary size), r(60)=0.261, p=0.044;
- Total number of different final particles, r(60)=0.299, p=0.020;
- Total number of sentences, r(60)=0.301, p=0.020;
- Total number of simple sentences, r(60)=0.258, p=0.046;
- Average number of words per second (speech rate), r(60)=0.367, p=0.004; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.275, p=0.033.

The results showed that the children had a larger vocabulary size and faster speech rate and higher speech fluency if they were exposed to Chinese storybooks or fairytale books at home. More precisely, storybooks were associated with the children using more clauses, more sentences, and more simple sentences, as well as higher speech accuracy (especially phonological accuracy) and

fewer English code-switches.

Frequency of the parents reading Chinese textbooks with their children at home

When asked the question "how often do you read Chinese textbooks with your child at home?", half the parents (30 out of 60) said "often", and eighteen (out of sixty) reported "always" (see table 4.23). This parameter correlated with some of the speech proficiency parameters:

- Total number of clauses, r(60)=0.280, p=0.030;
- Total number of phonological errors, r(60)=-0.262, p=0.043;
- Total number of tone errors, r(60)=-0.464, p<0.001;
- Average number of words per second (speech rate), r(60)=0.302, p=0.019; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.257, 0=0.048.

Children's engagement with reading Chinese textbooks at home

Most of the children (42 out of 60) reported that they read Chinese textbooks at home (see table 4.24). This parameter correlated with some of the Mandarin language proficiency parameters:

- Total number of different final particles, r(60)=0.364, p=0.004;
- Total number of sentences, r(60)=0.270, p=0.037;
- Average number of words per second (speech rate), r(60)=0.268, p=0.038;
- Total number of Chinese characters written, r(60)=0.327, p=0.011;
- Total number of different Chinese characters written, r(60)=0.337, p=0.009; and
- Total number of correct Chinese characters written, r(60)=0.324, p=0.012.

The results showed that the children's speech rate covaried with their exposure to Chinese textbooks at home. They produced more clauses, made fewer errors overall (particularly fewer phonological errors), and achieved higher speech fluency if their parents regularly read Chinese textbooks with them at home. In addition, they spoke more sentences and wrote more different and correct Chinese characters if they practised reading Chinese textbooks at home.

Children's learning of Chinese idioms at home

Most of the children (42 out of 60) reported that they did not learn Chinese idioms at home, and the rest (18 out of 60) learned idioms (see table 4.24), e.g., "鼠目寸光/short-sighted" or "得寸进尺/push one's luck". This parameter correlated with two of the speech proficiency parameters:

- Total number of different nouns, r(60)=0.257, p=0.048; and
- Total number of different verbs, r(60)=0.276, p=0.033.

Children's learning of Chinese proverbs at home

Most of the children (53 out of 60) reported that they did not learn Chinese proverbs at home, and the rest (7 out of 60) learned proverbs (see table 4.24), e.g., "一寸光阴一寸金, 寸金难买寸光阴/time flies" or "不怕一万, 就怕万一/in case". No correlations were noted between this parameter and the children's Mandarin language proficiency parameters, probably due to the limited number of the children that were learning Chinese proverbs at home.

It appeared that few children learned Chinese idioms or proverbs at home; however, if they could get a chance to learn them, they could acquire more diverse lexical items such as different nouns and verbs.

Frequency of the parents teaching their children Chinese literature at home

When asked the question "how often do you teach your child Chinese literatures such as Chinese poems at home?", twenty-seven (out of sixty) of the parents responded "sometimes", sixteen (out of sixty) answered "often", and twelve (out of sixty) reported "rarely" (see table 4.23). This parameter correlated with three of the speech proficiency parameters:

- Total number of phrases, r(60)=0.315, p=0.014;
- Total number of tone errors, r(60)=-0.270, p=0.037; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.286, p=0.027.

Children's practices in Chinese literatures at home

More than half the children (38 out of 60) reported that they learned Chinese literatures at home (see table 4.24), i.e., Chinese poems, such as "咏鹅/goose" or "春晓/spring morning". This parameter correlated with the following children's speech proficiency parameters:

- Total number of Chinese words, r(60)=0.260, p=0.045;
- Total number of different Chinese words (vocabulary size), r(60)=0.292, p=0.023;
- Total number of different verbs, r(60)=0.336, p=0.009;
- Total number of different final particles, r(60)=0.318, p=0.013; and
- Total number of different Chinese utterances, r(60)=0.263, p=0.042.

As noted, the children's vocabulary, such as different verbs, final particles, and phrases, covaried with their exposure to Chinese literatures at home. Besides, they produced more utterances in varied ways and commanded a higher speech fluency if they learned Chinese literatures at home. In addition, probably by practising the rhythm of Chinese poems, the children made fewer tone errors in their speech. For example, the word "觉" used in the Chinese poem "春晓/spring morning", which was pronounced as "jue" with the third tone in "春眠不觉晓" and used as a verb meaning "feel"; however, it was pronounced as "jiao" with the forth tone in the phrase "睡觉" as a noun meaning "sleep". Thus, the children's speech accuracy (especially phonological accuracy) could be likely promoted by learning and practising Chinese poems.

Frequency of the parents holding Chinese cultural activities with their children at home

When asked the question "how often do you hold Chinese cultural activities (such as 剪纸/paper-cutting, or 包饺子/making dumplings) with your child at home?", around half the parents (31 out of 60) said "sometimes", twenty-two (out of sixty) stated "often", and twelve (out of sixty) reported "rarely" (see table 4.23). This parameter correlated with two of the speech proficiency parameters:

- Total number of different verbs, r(60)=0.271, p=0.036; and
- Total number of tone errors, r(60)=-0.287, p=0.032.

Children's engagement in Chinese cultural activities at home

Most of the children (49 out of 60) reported that they engaged in Chinese cultural activities at home (see table 4.24), i.e., "Painting/水墨画", "Singing Chinese songs/唱中文歌曲", "Paper-cutting/剪纸", "Martial arts/武术", "Calligraphy/书法", "Dizi/笛子", "Hulusi/葫芦丝", "Abacus/算盘", or "Lion dance/舞狮". This parameter correlated with the children's speech proficiency parameter "average number of words per sentence (sentence length)", r(60)=0.259, p=0.045.

The results presented that the children were more likely to acquire more verbs and make fewer tone errors if their parents held Chinese cultural activities at home. In addition, the children produced longer sentences if they engaged in cultural activities at home.

Frequency of the parents playing Chinese games with their children at home

When asked the question "how often do you play Chinese games with your child at home?", twenty-eight (out of sixty) of the parents answered "often", and twenty-four (out of sixty) replied "always" (see table 4.23). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.322, p=0.012;
- Total number of different verbs, r(60)=0.298, p=0.021;
- Total number of different final particles, r(60)=0.287, p=0.026;
- Total number of clauses, r(60)=0.317, p=0.014;
- Total number of tone errors, r(60)=-0.320, p=0.013; and
- Length of English code-switches (in words), r(60)=-0.280, p=0.030.

Children's engagement in Chinese games at home

Most of the children (49 out of sixty) indicated that they played Chinese games at home (see table 4.24), such as Mahjong/麻将", "Five-in-a-row/五子棋", "Jump chess/跳棋", "Go/围棋", "Ping Pong/乒乓球", "Chinese cards/纸牌", "Rock-paper-scissors/剪刀石头布", "Flying chess/飞行棋", "YoYo/悠悠球", "Legends of the three kingdoms/三国杀", "Badminton/羽毛球", "Volleyball/排球", or "Building blocks/拼积木". This parameter correlated with the Mandarin speech proficiency parameter "total number of segmental errors", r(60)=-0.267, p=0.039.

The results showed that the children were more likely to obtain a larger vocabulary size, such as different verbs and final particles, produce more clauses, and make fewer English code-switches if their parents played Chinese games with them at home. Notably, the children's pronunciation of tone and segmental accuracy covaried with their playing Chinese games at home, probably due to the requirements of accurately clarifying the game rules in Mandarin.

Frequency of the parents celebrating Chinese traditional festivals with their children at home

When asked the question "how often do you celebrate Chinese traditional festivals with your child at home?", twenty-eight (out of sixty) of the parents answered "always", and twenty-four (out of sixty) reported "often" (see table 4.23). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.260, p=0.045;

- Total number of different verbs, r(60)=0.330, p=0.010;
- Total number of different final particles, r(60)=0.274, p=0.034;
- Total number of clauses, r(60)=0.290, p=0.024;
- Total number of tone errors, r(60)=-0.276, p=0.033;
- Average number of English code-switches per utterance, r(60)=-0.280, p=0.031; and
- Length of English code-switches (in words), r(60)=-0.309, p=0.016.

Children's engagement in celebrating Chinese traditional festivals at home

Almost all the children (57 out of 60) indicated that they celebrated Chinese traditional festivals at home (see table 4.24), such as Chinese Mid-autumn Day or Spring Festival. Yet, no correlations were found between this parameter and the children's Mandarin language proficiency parameters.

The results showed that the children's production of different lexical items, such as diverse verbs and final particles, the number of clauses they used in sentences, their tone accuracy, and their English code-switches all covaried with the frequency of their parents celebrating Chinese festivals with them at home.

Frequency of the parents assisting their children with Mandarin language assignments at home

In response to the question "how often do you assist your child's Mandarin language assignments at home?", twenty-three (out of sixty) of the parents reported "often", and thirteen (out of sixty) answered "never" (see table 4.23). This parameter correlated with three of the children's Mandarin language proficiency parameters:

- Total number of verbs, r(60)=0.287, p=0.026;
- Total number of different final particles, r(60)=0.288, p=0.026; and
- Total number of Chinese characters written, r(60)=0.271, p=0.036.

Children's engagement in writing Mandarin language assignments at home

Most of the children (39 out of 60) stated that they wrote Mandarin language assignments at home since they went to Mandarin Chinese heritage language schools (see table 4.24). This parameter correlated with three of the Mandarin language proficiency parameters:

- Total number of Chinese characters written, r(60)=0.394, p=0.002;

- Total number of different Chinese characters written, $r(60)=0.427$, $p<0.001$; and
- Total number of correct Chinese characters written, $r(60)=0.407$, $p<0.001$.

The results showed that the children's ability to write Chinese characters (especially different and correct characters) covaried with their engagement in writing Mandarin language assignments that they received from Mandarin Chinese language schools. In addition, they spoke more different verbs and final particles if their parents regularly instructed them with Mandarin language assignments at home.

Frequency of the parents encouraging their children to call relatives who speak Mandarin at home

When asked the question "how often do you encourage your child to call Mandarin-speaking relatives at home?", twenty-eight (out of sixty) of the parents answered "often", and fifteen (out of sixty) reported "sometimes" (see table 4.23). This parameter correlated with three of the children's speech proficiency parameters:

- Total number of tone errors, $r(60)=-0.336$, $p=0.009$;
- Average number of English code-switches per utterance, $r(60)=-0.279$, $p=0.031$; and
- Length of English code-switches (in words), $r(60)=-0.357$, $p=0.005$.

Children's engagement in calling Mandarin-speaking relatives at home

Most of the children (53 out of 60) reported that they called Mandarin-speaking relatives at home (see table 4.24), such as relatives living in China. No correlations were noted between this parameter and the children's Mandarin language proficiency parameters.

The results demonstrated that children rarely shifted to English and made fewer tone errors if their parents regularly encouraged them to call Mandarin-speaking relatives at home.

Frequency of the parents encouraging their children to speak Mandarin at home

When asked the question "how often do you encourage your child to speak Mandarin at home?", half the parents (30 out of 60) answered "often", and twenty-three (out of sixty) reported "always" (see table 4.23). This parameter correlated with some of the children' speech proficiency parameters:

- Total number of incomplete sentences, $r(60)=-0.366$, $p=0.004$;

- Total number of tone errors, r(60)=-0.277, p=0.032;
- Total number of grammatical errors, r(60)=-0.365, p=0.004;
- Average number of English code-switches per utterance, r(60)=-0.378, p=0.003; and
- Length of English code-switches (in words), r(60)=-0.402, p<0.001.

Frequency of the parents praising their children in Mandarin at home

When asked the question "how often do you praise your child in Mandarin at home?", around half the parents (31 out of 60) answered "often", and twenty-three (out of sixty) reported "always" (see table 4.23). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of clauses, r(60)=0.261, p=0.044;
- Total number of grammatical errors, r(60)=-0.255, p=0.049;
- Total number of tone errors, r(60)=-0.262, p=0.043;
- Average number of English code-switches per utterance, r(60)=-0.361, p=0.005; and
- Length of English code-switches (in words), r(60)=-0.359, p=0.005.

Frequency of the parents disciplining their children in Mandarin at home

In response to the question "how often do you discipline your child in Mandarin at home?", twenty-eight (out of sixty) of the parents said "often", and twenty-two (out of sixty) stated "always" (see table 4.23). This parameter correlated with a few of the speech proficiency parameters:

- Total number of clauses, r(60)=0.262, p=0.043;
- Average number of English code-switches per utterance, r(60)=-0.268, p=0.039; and
- Length of English code-switches (in words), r(60)=-0.273, p=0.035.

Frequency of the parents instructing their children in Mandarin at home

In response to the question "how often do you instruct your child in Mandarin at home, such as using Mandarin for instructing your child homework, or toys' installation?", around half the parents (32 out of 60) stated "often", and nineteen (out of sixty) said "always" (see table 4.23). This parameter correlated with the following children's Mandarin speech proficiency parameters:

- Total number of Chinese words, r(60)=0.330, p=0.010;
- Total number of different Chinese words (vocabulary size), r(60)=0.339, p=0.008;

- Total number of different nouns, r(60)=0.306, p=0.018;
- Total number of different verbs, r(60)=0.442, p<0.001;
- Total number of different final particles, r(60)=0.281, p=0.030;
- Total number of different grammatical particles, r(60)=0.289, p=0.025;
- Total number of sentences, r(60)=0.273, p=0.035;
- Total number of clauses, r(60)=0.283, p=0.028;
- Total number of phonological errors, r(60)=-0.388, p=0.002;
- Total number of segmental errors, r(60)=-0.352, p=0.006;
- Average number of words per second (speech rate), r(60)=0.298, p=0.021;
- Average number of pauses per utterance (speech fluency), r(60)=-0.398, p=0.002; and
- Average number of English code-switches per utterance, r(60)=-0.322, p=0.012.

It appeared that the children were more likely to obtain a larger vocabulary size with various lexical items, such as distinct nouns, verbs, final particles and grammatical particles, produce more complete sentences with multiple clauses, make fewer phonological and grammatical errors, and develop a higher speech rate and speech fluency if their parents regularly spoke Mandarin as well as praised, disciplined, and instructed them in Mandarin at home. If the above language practices were more frequent, children were also less likely to code-switch to English.

4.4.2 Language use and exposure in the Chinese community (as reported by the parents and children)

Parents' friends who speak Mandarin as their first language

More than half the parents (47 out of 60) sated that "most" of their friends spoke Mandarin as their first language, nine (out of sixty) indicated "half of them" did, and four (out of sixty) said "all of them" did. This parameter correlated with a few of the speech proficiency parameters:

- Total number of Chinese words, r(60)=0.311, p=0.016;
- Total number of different Chinese words (vocabulary size), r(60)=0.257, p=0.047; and
- Total number of sentences, r(60)=0.295, p=0.022.

Frequency of the parents using Mandarin with their friends who speak Mandarin

In response to the question "how often do you speak Mandarin with your friends who speak

Mandarin?", most of the parents (47 out of 60) reported "always", and the rest (13 out of 60) of them replied "often". This parameter correlated with some of the speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), r(60)=0.284, p=0.028;
- Total number of different verbs, r(60)=0.285, p=0.027;
- Average number of words per utterance (utterance length), r(60)=0.280, p=0.030;
- Average number of words per second (speech rate), r(60)=0.267, p=0.039; and
- Average number of pauses per utterance (speech fluency), r(60)=-0.259, p=0.046.

As noted, most of the parents had friends who spoke Mandarin as their first language. The results demonstrated that the children produced more different lexical items, longer utterances, and commanded a higher speech rate and speech fluency if their parents usually used Mandarin with their Mandarin-speaking friends.

Children's friends who can speak Mandarin

The number of the children's friends who could speak Mandarin and who could speak fluent Mandarin was presented in table 4.25. The frequency of the children meeting with their friends who spoke Mandarin and their language use with those friends was also reported by the children. In addition, the children's reports about the types of friends (based on the language they usually speak, such as Mandarin, English, or other languages, i.e., Cantonese, or French) that they had the most, and played with and visited regularly were summarized in table 4.26.

Table 4.25

Numbers of Mandarin-speaking friends the children have (as reported by the children)

Numbers of Mandarin-speaking friends that children have/child responses	≥ 20	10 to 20	5 to 10	≤ 5	Total
friends who can speak Mandarin	1 (2%)	8 (14%)	24 (40%)	26 (44%)	59
friends who can speak fluent Mandarin	0 (0%)	4 (7%)	14 (24%)	41 (69%)	59

Table 4.26

Types of friends the children have, play with, and visit (as reported by the children)

Types of the children's friends/child responses	friends who usually speak Mandarin	friends who usually speak English	equal number of those friends	friends who usually speak other languages	Total
I have the most	6 (10%)	43 (72%)	11 (18%)	0 (0%)	60
I regularly play with	5 (8%)	26 (43%)	29 (49%)	0 (0%)	60
I regularly visit	25 (42%)	17 (28%)	16 (27%)	2 (3%)	60

Number of the children's friends who can speak Mandarin

The children (59 out of 60) who had Mandarin-speaking friends answered the question "how many Mandarin-speaking friends do you have?". Twenty-six (out of fifty-nine) of the children reported "less than five", and twenty-four (out of fifty-nine) stated "between 5 and 10" (see table 4.25). This parameter correlated with two of the children's speech proficiency parameters:

- Total number of different classifiers, $r(59)=0.321$, $p=0.013$; and
- Total number of different grammatical particles, $r(59)=0.263$, $p=0.044$.

Number of the children's friends who can speak fluent Mandarin

Most of the children (41 out of 59) stated that they had "less than five" friends who could speak fluent Mandarin, and fourteen (out of fifty-nine) children indicated that they had "between five and ten" (see table 4.25). This parameter correlated with the speech proficiency parameter "total number of different classifiers", $r(59)=0.285$, $p=0.029$.

Frequency of the children meeting with their friends who speak Mandarin

In response to the question "how often do you meet with your friends who speak Mandarin?", the children's responses (n=59) were as follows: "everyday" (n=11, 19%), "few times a week" (n=14, 24%), "once or twice a week" (n=24, 40%), "once or twice a month" (n=8, 14%), and "once or twice a year" (n=2, 3%). This parameter correlated with several of the children's Mandarin speech proficiency parameters:

- Total number of phonological errors, r(59)=-0.257, p=0.050;
- Total number of grammatical errors, r(59)=-0.261, p=0.046; and
- Length of English code-switches (in words), r(59)=-0.315, p=0.015.

The results showed that most of the children had "less than ten" friends who could speak Mandarin, and the frequency of the children meeting with those friends was just "once or twice a week", which was probably due to most of their time being spent in English-speaking public schools. In addition, it appeared that the children's acquisition of different lexical items such as various classifiers and grammatical particles covaried with the number of Mandarin-speaking friends they had. In addition, the children made fewer phonological errors, grammatical errors, and fewer English code-switches if they regularly met with their Mandarin-speaking friends.

Children's language use with their friends who speak Mandarin

The children (59 out of 60) who had friends that spoke Mandarin answered the question "which language do you usually speak to your friends who speak Mandarin?". Their responses were as follows: "Mandarin" (n=11, 19%), both "Mandarin and English" (n=27, 46%), "English" (n=20, 33%), and "only Chinese dialects" (n=1, 2%). This parameter correlated with the children's speech proficiency parameter "total number of different final particles", r(59)=0.364, p=0.005.

As noted, the children's number of different final particles was larger if they usually spoke Mandarin with their Mandarin-speaking friends.

Language spoken by the friends the children have the most

When asked the question "what languages do most of your friends speak?", forty-three (out of sixty) of the children indicated that they had "friends who usually spoke English", and eleven (out of sixty) reported an "equal number of friends who usually spoke Mandarin and those who usually spoke English" (see table 4.26). This parameter correlated with a few of the children's Mandarin language proficiency parameters:

- Total number of errors, r(60)=0.260, p=0.045; and
- Total number of Chinese characters written, r(60)=-0.297, p=0.021.

Languages spoken by the friends the children play with regularly

In response to the question "which language is spoken most often by the friends you play

with regularly?", twenty-nine (out of sixty) of the children said that they frequently played with an "equal number of friends who usually spoke Mandarin and those who usually spoke English", and twenty-six (out of sixty) replied that they generally played with "friends who usually spoke English" (see table 4.26). No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Language spoken by the friends the children visit regularly

In regard to the question "what are the languages spoken by friends whom you regularly visit?", twenty-five (out of sixty) of the children indicated that they frequently visited with "friends who usually speak Mandarin", seventeen (out of sixty) replied that they visited "friends who usually spoke English", and sixteen (out of sixty) reported they visited an "equal number of friends who usually spoke Mandarin and those who usually spoke English" (see table 4.26). This parameter correlated with some of the children's speech proficiency parameters:

- Total number of Chinese words, $r(60)=0.281$, $p=0.029$;
- Total number of different Chinese words (vocabulary size), $r(60)=0.278$, $p=0.031$;
- Total number of different nouns, $r(60)=0.291$, $p=0.024$;
- Total number of different classifiers, $r(60)=0.257$, $p=0.048$;
- Total number of different grammatical particles, $r(60)=0.469$, $p<0.001$;
- Average number of English code-switches per utterance, $r(60)=-0.330$, $p=0.010$; and
- Length of English code-switches (in words), $r(60)=-0.270$, $p=0.037$.

As seen, most of the children had friends who usually spoke English and also frequently played with friends who spoke English, probably due to attending English-speaking public schools. It showed that the children's number of errors and ability to write Chinese characters covaried with the language spoken by most of their friends. Controversially, the results indicated that the children frequently visited friends who usually spoke Mandarin, probably because their parents regularly took them to visit Chinese families whose children spoke Mandarin. It appeared that the children's acquisition of different lexical items, such as diverse nouns, classifiers, and grammatical particles, increased and the number of English code-switches decreased if they frequently visited friends who usually spoke Mandarin.

Chinese community

The summary of data representing the children's visits to Chinese community venues where Mandarin was spoken was summarized in table 4.27. In addition, the frequency of the parents taking their children to visit those venues as reported by the parents was presented in table 4.28.

Table 4.27

Children's exposure to Mandarin-related places and activities

(as reported by the children)

Children's exposure to Mandarin-related places and activities/ child responses	Yes	No	Total
attending Chinese churches	20 (33%)	40 (67%)	60
visiting Chinese restaurants	55 (91%)	5 (9%)	60
visiting Chinese stores	51 (85%)	9 (15%)	60
participating in Mandarin-related activities	32 (53%)	28 (47%)	60

Table 4.28

Frequency of the children's exposure to Mandarin-related places and activities

(as reported by the parents)

Frequency of the children's exposure to Mandarin-related places and activities/ parent responses	Always	Often	Some-times	Rarely	Never	Total
attending Chinese churches	4 (7%)	8 (13%)	6 (10%)	14 (23%)	28 (47%)	60
visiting Chinese restaurants and stores	3 (5%)	26 (43%)	21 (35%)	10 (17%)	0 (0%)	60
participating in the activities held by Chinese communities	2 (3%)	17 (28%)	23 (38%)	12 (20%)	6 (10%)	60

Children's exposure to Chinese churches

Most of the children (40 out of 60) reported that they did not attend Chinese churches, and

the rest (20 out of 60) stated that they did (see table 4.27). No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Frequency of the children attending Chinese churches

When asked the question "how often do you take your child to attend Chinese churches?", twenty-eight (out of sixty) of the parents answered "never", and fourteen (out of sixty) reported "rarely" (see table 4.28). No correlations were detected between this parameter and the children's Mandarin language proficiency parameters.

Probably due to the limited number of the children attending Chinese churches, no correlations were revealed between their experiences with Chinese churches and their Mandarin language proficiency.

Children's exposure to Chinese restaurants

Most of the children (55 out of 60) indicated that they visited Chinese restaurants (see table 4.27). No correlations were revealed between this parameter and the children's Mandarin language proficiency parameters.

Children's exposure to Chinese stores

Most of the children (51 out of 60) stated that they visited Chinese stores (see table 4.27). This parameter correlated with two of the children's speech proficiency parameters:

- Total number of sentences, $r(60)=0.262$, $p=0.043$; and
- Total number of complex and compound sentences, $r(60)=0.284$, $p=0.028$.

Frequency of the children visiting places (Chinese restaurants/stores) where Mandarin is spoken

In response to the question "how often do you take your child to visit places where Mandarin is spoken, i.e., Chinese restaurants or stores?", twenty-six (out of sixty) of the parents answered "often", twenty-one (out of sixty) reported "sometimes", and ten (out of sixty) indicated "rarely" (see table 4.28). No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

The results showed that the children produced more sentences, such as more complex and compound sentences if they visited Chinese stores, probably because they needed to use Mandarin

there in order to ask for help finding the items or paying for the items.

Children's exposure to Mandarin-related activities

Around half the children (32 out of 60) indicated that they engaged in Mandarin-related activities (see table 4.27), such as "Chinese New Year Gala" or "Folk Festival". This parameter correlated with some of the children's speech proficiency parameters:

- Total number of Chinese characters written, $r(60)=0.405$, $p<0.001$;
- Total number of different Chinese characters written, $r(60)=0.448$, $p<0.001$; and
- Total number of correct Chinese characters written, $r(60)=0.430$, $p<0.001$.

Frequency of the children engaging in the activities held by Chinese communities

Responding to the question "how often do you take your child to participate in Mandarin-related activities held by Chinese communities, such as Chinese New Year Gala, or Folk Festival?", twenty-three (out of sixty) of the parents stated "sometimes", seventeen (out of sixty) said "often", and twelve (out of sixty) replied "rarely" (see table 4.28). This parameter correlated with the speech proficiency parameter "total number of complex and compound sentences", $r(60)=0.255$, $p=0.050$.

It appeared that the children's ability to write Chinese characters covaried with their experiences with Mandarin-related activities, probably because these activities included more exposure to Mandarin and motivated them to learn the Chinese culture and language. In addition, the children spoke comparatively more complex and compound sentences if they regularly engaged in Mandarin-related activities such as those held by Chinese communities.

Language use in the Chinese community

The parents' and children's responses to their language use while visiting Chinese community venues (such as Chinese churches, restaurants, and stores) and participating in Chinese activities (such as those held by Chinese communities) were reported by the parents (as shown in table 4.29) and children (as displayed in table 4.30).

Table 4.29

Parents' language use in Chinese places and activities

(as reported by the parents)

Language use/parent responses	Only Mandarin	Mostly Mandarin	Mandarin and English	Mostly English	Only English	Only Chinese dialects	Total
in Chinese churches	7 (30%)	14 (61%)	2 (9%)	0 (0%)	0 (0%)	0 (0%)	23
in Chinese restaurants and stores	23 (38%)	33 (55%)	3 (5%)	1 (2%)	0 (0%)	0 (0%)	60
in Chinese activities	21 (51%)	17 (40%)	4 (9%)	0 (0%)	0 (0%)	0 (0%)	42

Table 4.30

Children's language use in Chinese places and activities

(as reported by the children)

Language use/ child responses	Mandarin	Mandarin and English	English	Only Chinese dialects	Total
in Chinese churches	5 (25%)	9 (45%)	6 (30%)	0 (0%)	20
in Chinese restaurants	24 (44%)	26 (47%)	3 (5%)	2 (4%)	55
in Chinese stores	17 (33%)	27 (53%)	5 (10%)	2 (4%)	51
in Chinese activities	5 (16%)	21 (66%)	5 (16%)	1 (2%)	32

Parents' language use in Chinese churches

The parents (23 out of 60) who attended Chinese churches responded to the question "which language do you usually use while attending Chinese church?". Fourteen (out of twenty-three) of the parents answered "mostly Mandarin", and seven (out of twenty-three) reported "only Mandarin" (see table 4.29). This parameter correlated with the children's speech proficiency parameter "total number of grammatical errors", $r(23)=-0.464$, $p=0.026$.

Children's language use in Chinese churches

Out of a total sixty children, only twenty of them stated that they attended Chinese churches. In response to the question "which language do you usually use while attending Chinese church?", nine (out of twenty) of the children answered both "Mandarin and English", and six (out of twenty) reported "English" (see table 4.30). No correlations were noted between this parameter and the children's Mandarin language proficiency parameters.

Probably because such a small number of families were involved in Chinese churches, only a few correlations were noted between the parents' and children's participation in Chinese church and the children's Mandarin language proficiency. One outcome worth noting was that the children seemed to make fewer grammatical errors if the parents regularly used Mandarin while attending Chinese churches.

Parents' language use in Chinese restaurants and stores

When asked the question "which language do you usually use when visiting Chinese restaurants and stores?", around half the parents (33 out of 60) answered "mostly Mandarin", and twenty-three (out of sixty) stated "only Mandarin" (see table 4.29). This parameter correlated with three of the children's speech proficiency parameters:

- Total number of tone errors, $r(60)=-0.264$, $p=0.041$;
- Average number of English code-switches per utterance, $r(60)=-0.296$, $p=0.022$; and
- Length of English code-switches (in words), $r(60)=-0.332$, $p=0.010$.

Children's language use in Chinese restaurants

Fifty-five (out of sixty) of the children who were taken to visit Chinese restaurants responded to the question "which language do you usually use while visiting Chinese restaurants?". Twenty-six (out of fifty-five) of the children answered both "Mandarin and English", and twenty-four (out of fifty-five) reported "Mandarin" (see table 4.30). This parameter correlated with several of the children's speech proficiency parameters:

- Average number of words per utterance (utterance length), $r(55)=0.372$, $p=0.005$;
- Total number of different final particles, $r(55)=0.379$, $p=0.004$;
- Total number of incomplete sentences, $r(55)=-0.298$, $p=0.027$;
- Total number of phonological errors, $r(55)=-0.279$, $p=0.039$;

- Total number of tone errors, $r(55)=-0.268$, $p=0.048$; and
- Average number of words per second (speech rate), $r(55)=0.443$, $p<0.001$.

Children's language use in Chinese stores

The children (51 out of 60) who were taken to visit Chinese stores answered the question "which language do you usually use while visiting Chinese stores?". Twenty-seven (out of sixty) of the children said both "Mandarin and English", and seventeen (out of sixty) stated "Mandarin" (see table 4.30). This parameter correlated with several of the Mandarin language proficiency parameters:

- Total number of different final particles, $r(51)=0.392$, $p=0.004$;
- Total number of Chinese characters written, $r(51)=0.314$, $p=0.025$;
- Total number of different Chinese characters written, $r(51)=0.344$, $p=0.013$; and
- Total number of correct Chinese characters written, $r(51)=0.315$, $p=0.024$.

The results showed that the children's number of final particles covaried with their language use while visiting Chinese restaurants and stores. More specifically, the children spoke more complete sentences and longer utterances, and obtained higher phonological accuracy and speech rate if they used Mandarin regularly while vising Chinese restaurants. In addition, they wrote more Chinese characters, such as different and correct Chinese characters, if they used Mandarin while visiting Chinese stores. Notably, the use of Chinese characters (on food labels and advertisements) in Chinese stores could enhance the children's knowledge of Chinese characters to some degree. In addition, they made fewer tone errors and rarely shifted to English if their parents regularly used Mandarin while visiting Chinese restaurants and stores.

Parents' language use in Chinese activities

Of the sixty parents, forty-two indicated that they participated in the activities held by Chinese clubs and communities, such as "Chinese New Year Celebration", "Chinese Folk Festival", "Chinese concert", "Chinese dancing club", "Chinese singing club", "Chinese martial arts club", and "Chinese gym". In responses to the question "which language do you usually use while participating in Chinese activities?", twenty-one (out of forty-one) of the parents answered "only Mandarin", and seventeen (out of forty-one) responded "mostly Mandarin" (see table 4.29). No correlations were found between this parameter and the Mandarin language proficiency parameters.

Children's language use in Chinese activities

The children (32 out of 60) who participated in Chinese activities answered the question "which language do you usually use when engaging in Chinese activities?". Most of the children (21 out of 32) said both "Mandarin and English", and an equal number of the children (5 out of 32) stated "Mandarin" and "English" (see table 4.30). No correlations were revealed between this parameter and the children's Mandarin language proficiency parameters.

Probably due to the limited opportunities to participate in Chinese activities (such as the activities usually held only on Chinese traditional festival days), there were no correlations found between parents' and children's language use and the children's Mandarin language proficiency.

4.4.3 Language use and exposure in Mandarin heritage language schools (as reported by the parents and children)

The data reported in this section were extracted from the parents' responses to questions about their children's learning progress in Mandarin heritage language schools. Another source of data was the children's interviews.

Children's attendance of Mandarin heritage language schools

In response to the question "has your child attended Mandarin heritage language schools?" most of the parents (46 out of 60) reported "yes", and the other fourteen parents said "no". The language schools included "Heritage Chinese Language School", "the Chinese Language School of Saskatoon", or "Bright Horizons Chinese School". This parameter correlated with four of the children's Mandarin language proficiency parameters:

- Average number of words per sentence (sentence length), $r(60)=0.331$, $p=0.010$;
- Total number of Chinese characters written, $r(60)=0.312$, $p=0.015$;
- Total number of different Chinese characters written, $r(60)=0.351$, $p=0.006$; and
- Total number of correct Chinese characters written, $r(60)=0.334$, $p=0.009$.

The results indicated that a child's attendance at a Mandarin heritage language school covaried with his/her knowledge of Chinese characters and ability to construct longer sentences.

Whether the children like going to Mandarin heritage language schools

The children (46 out of 60) who attended Mandarin heritage language schools responded to the question "do you like going to Mandarin heritage language schools?". Most of the children (27 out of 46) responded affirmatively, and the other nineteen responded negatively. This parameter correlated with the children's speech proficiency parameter "total number of incomplete sentences", $r(46)=-0.294$, $p=0.047$. It showed that the children spoke more complete sentences if they liked going to Mandarin heritage language schools.

Some of the children described the reasons why they liked attending Mandarin heritage language schools as follows: "they want to learn and speak Mandarin" (fourteen responses), "they want to meet and play with Chinese friends" (nine), "they feel Mandarin language classes are very fun and useful because they can use Mandarin to sell things to Chinese people and play Chinese chess in class" (four), "he/she can watch Mandarin videos in class" (one), "he/she can have some break time by attending Chinese language schools" (one), "he/she prepares for the future if he/she visits China or works in China" (one), and "he/she feels Mandarin is very easy to learn" (one).

As for the children who disliked going to Chinese language schools, they reported the following reasons for this sentiment: "they feel pressure because Mandarin language classes have too much homework, such as lots of writing and presentations" (seven responses), "they dislike learning Mandarin for no reason" (five), "they feel that learning Mandarin is too boring" (four), "they feel that Mandarin classes take too long" (three), "they feel that Mandarin is too hard to understand" (two), "they can only read with Pin Yin" (two), "they feel they read and write poorly in Chinese" (two), "they feel that their playing time is interrupted" (two), "they feel that Mandarin language tests are too hard" (two), "he/she dislikes learning calligraphy" (one), and "he/she dislikes the teacher's criticism" (one).

Whether the children are willing to go to Mandarin heritage language schools if they have not attended it yet

Fourteen (out of sixty) of the children who had not attended Mandarin heritage language schools at the time of the study responded to the question "are you willing to attend Mandarin heritage language school?". Of these fourteen children, eight were "unwilling" and six were "willing" to attend heritage language schools. This parameter correlated with two of the Mandarin language proficiency parameters:

- Total number of clauses, r(14)=-0.564, p=0.036;
- Total number of correct Chinese characters written, r(14)=-0.634, p=0.015.

The children who were unwilling to attend Mandarin heritage language schools explained their reasons as follows: “they feel that Mandarin is too hard to learn” (two responses) and “he/she feels there is too much to learn” (one). As for the children who were willing to attend the schools, they answered that “they want to make Chinese friends” (two responses) and “learn Mandarin” (one), and “he/she feels that learning Mandarin is very fun” (one).

It appeared that the children’s production of clauses and their ability to write correct Chinese characters covaried with their willingness to attend Mandarin heritage language schools if they had not attended one at the time of the study.

The highest level of Mandarin language class that the children reach

When asked the question “what is the highest level of Mandarin language class that your child has reached?”, the parents (46 out of 60) whose children attended Mandarin heritage language schools provided their answers: “preschool level” (n=3, 7%) and “elementary school level” (n=43, 93%). This parameter correlated with the speech proficiency parameter “total number of Chinese words”, r(46)=0.295, p=0.046.

In addition, the parents (43 out of 46) whose children achieved the elementary level of Mandarin language class answered the question “which grade of elementary level did your child achieve?”. Their responses were as follows: “grade 1” (n=21, 49%), “grade 2” (n=4, 9%), “grade 3” (n=8, 19%), “grade 4” (n=2, 5%), “grade 5” (n=2, 5%), and “grade 6” (n=6, 13%). The parameter “the elementary grades’ level of Mandarin language class that children achieve” correlated with a few of the children’s Mandarin language proficiency parameters:

- Total number of phrases, r(43)=0.312, p=0.042; and
- Total number of correct Chinese characters written, r(43)=0.356, p=0.019.

The results showed that the children acquired more words and phrases and wrote more Chinese characters if they had at least reached elementary grade one level of Mandarin language classes.

The highest Mandarin language level that the children achieve

The parents (46 out of 60) whose children attended Mandarin heritage language schools

answered the question "what is the highest Mandarin language level that your child has achieved?". Their replies were "primary level" (n=40, 87%) and "secondary level" (n=6, 13%). This parameter correlated with some of the children's Mandarin language proficiency parameters:

- Total number of different Chinese words (vocabulary size), $r(46)=0.298$, $p=0.044$;
- Total number of different grammatical particles, $r(46)=0.296$, $p=0.046$;
- Average number of words per second (speech rate), $r(46)=0.482$, $p<0.001$; and
- Total number of correct Chinese characters written, $r(46)=0.346$, $p=0.019$.

These findings showed that the children obtained a larger vocabulary size (such as diverse grammatical particles), wrote more correct Chinese characters, and achieved a higher speech rate if they attained a primary Mandarin language level.

Duration of the children's attendance at Mandarin language classes

The parents (46 out of 60) whose children attended Mandarin heritage language schools answered the question "how long has your child been attending Mandarin language classes?". Their answers were as follows: "over one year" (n=29, 64%), "one year" (n=9, 20%), "over one and a half years" (n=4, 8%), "one and a half years" (n=2, 4%), and "under one and a half years" (n=2, 4%). This parameter correlated with the children's speech proficiency parameter "total number of sentences", $r(46)=0.295$, $p=0.047$.

It appeared that the children produced more sentences if they went to Mandarin language classes for a longer period of time, such as "over a year".

Frequency of the children's attendance at Mandarin language classes

The parents (46 out of 60) whose children attended Mandarin heritage language schools answered the question "how often does your child attend Mandarin language classes?". Their responses were: "every weekend" (n=9, 20%), "one to two days per week" (n=7, 15%), "half a day per week" (n=1, 2%), "a few hours per week" (n=28, 61%), and "less than two hours per week" (n=1, 2%). This parameter correlated with two of the children's speech proficiency parameters:

- Average number of English code-switches per utterance, $r(46)=-0.307$, $p=0.038$; and
- Length of English codeswitches (in words), $r(46)=-0.313$, $p=0.034$.

As noted, it appeared that the number of the children's English code-switches covaried with the frequency of their attendance at Mandarin language classes.

Parents' level of satisfaction with their children's Mandarin language learning in Chinese heritage language schools

The parents (46 out of 60) whose children attended Mandarin Chinese heritage language schools answered the question "how satisfied are you with your child's Mandarin language learning in Chinese heritage language schools?". Their answers were listed along: "very satisfied" (n=5, 11%), "satisfied" (n=20, 44%), "unsure (neither satisfied nor dissatisfied)" (n=18, 39%), "dissatisfied" (n=2, 4%), and "very dissatisfied" (n=1, 2%). This parameter correlated with the children's speech proficiency parameter "total number of lexical errors", $r(46)=-0.341$, $p=0.020$.

The results displayed a covariance between the parents' level of satisfaction with their children's Mandarin language learning in Chinese heritage language schools and the children's lexical accuracy.

Children's attendance of Mandarin heritage language schools (at the time of this study)

Out of the forty-six parents whose children attended Mandarin heritage language schools, most of them (39 out of 46) indicated that their children still attend heritage language schools at the time of this study, and the other seven reported that their children no longer attended heritage language schools. This parameter correlated with two of the Mandarin language proficiency parameters:

- Total number of Chinese characters written, $r(46)=0.329$, $p=0.026$; and
- Total number of different Chinese characters written, $r(46)=0.311$, $p=0.036$.

The results showed that the children gained more opportunities of learning Chinese characters if they attended Mandarin heritage language schools.

Whether the children like the Mandarin heritage language schools that they attend (at the time of this study)

The children (39 out 46) who still attended Mandarin heritage language schools at the time of this study responded to the question "do you like attending current Mandarin heritage language schools?". Most of the children (37 out of 39) said "yes", and the other two stated "no". This parameter correlated with some of the children's speech proficiency parameters:

- Total number of Chinese words, $r(39)=0.421$, $p=0.008$;

- Total number of different Chinese words (vocabulary size), $r(39)=0.372$, $p=0.020$;
- Total number of different verbs, $r(39)=0.544$, $p<0.001$; and
- Total number of sentences, $r(39)=0.400$, $p=0.012$.

The results showed that the children acquired a larger vocabulary size, such as various verbs, and produced more sentences if they liked going to Mandarin heritage language schools that they attended at the time of this study.

Whether the children like writing Mandarin language assignments

The children (39 out of 46) who attended Mandarin heritage language schools at the time of this study answered the question "do you like writing Mandarin language assignments?". Most of the children (24 out of 39) replied "no", and the other fifteen reported "yes". No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Some of the children explained that they disliked writing Mandarin language assignments for the following reasons: "they feel that the homework is too hard" (ten responses), "they feel that there is too much homework" (eight), and "they feel that the homework is too boring" (four). On the other hand, the children who liked writing Mandarin language assignments described their reasons as follows: "they like to learn Mandarin" (five responses), and "he/she finds learning Mandarin interesting since Chinese writing is just like drawing pictures" (one).

When compared to the assignments that the children received from public schools, the Mandarin language assignments that they received from Chinese heritage language schools were viewed as "too much and too hard" by most of the children, which was probably one of the reasons why some of the children discontinued going to Chinese language schools.

Children's language use in Mandarin heritage language schools

The children's reports about their language use during Mandarin language classes and during the breaks between Mandarin language classes were summarized in table 4.31.

Table 4.31

Children's language use in Mandarin heritage language schools (as reported by the children)

Children's language use/ child responses	Mandarin	Mandarin and English	English	Only Chinese dialects	Total
during Mandarin language classes	17 (44%)	21 (47%)	1 (5%)	0 (4%)	39
during the breaks between Mandarin language classes	6 (33%)	19 (53%)	14 (10%)	0 (4%)	39

Children's language use during Mandarin language classes

The children (39 out of 60) who attended Mandarin heritage language schools at the time of this study answered the question "which language do you usually use during Mandarin language classes?". Around half the children (21 out of 39) indicated that they usually used both "Mandarin and English", and seventeen (out of thirty-nine) said "Mandarin" (see table 4.31). No correlations were found between this parameter and the children's Mandarin language proficiency parameters.

Children's language use during the breaks between Mandarin language classes

The children (39 out of 60) who attended Mandarin heritage language schools at the time of this study responded to the question "which language do you usually use during the breaks between Mandarin language classes?". Close to half the children (19 out of 39) reported that they usually spoke both "Mandarin and English", and fourteen (out of thirty-nine) answered "English" (see table 4.31). This parameter correlated with some of the speech proficiency parameters:

- Total number of Chinese utterances, $r(39)=-0.346$, $p=0.031$; and
- Total number of different Chinese utterances, $r(39)=-0.348$, $p=0.030$.

It appeared that the children produced fewer utterances with less diversity if they used more English during the breaks between Mandarin language classes in Chinese language schools.

4.4.4 Language use and exposure in China (as reported by the parents and children)

Some information about the children's trips to China was gathered from the parents' responses to survey questions such as whether their children visit China and how often they bring

their children to visit China. More information reported here came from the children's answers during the interviews.

Whether the children would like to visit China

Every child participant had been taken on a trip to China, as reported by all the parent participants. When asked the question "would you like to visit China again?", most of the children (56 out of 60) stated "yes", and only four said "no". No correlations were revealed between this parameter and the children's Mandarin language proficiency parameters.

The children who would like to visit China again explained their reasons as follows: "they want to meet family members and relatives in China" (thirty responses), "they have fun in China" (twenty), "they think China is their mother country" (two), and "she/he wants to learn Mandarin" (one). As for the children who did not want to visit China again, they described their reasons in the following ways: "they dislike the environments in China" (two responses), "she/he is afraid of taking airplanes" (one), and "he/she feels no need to go since all his/her family members are in Canada" (one).

Frequency of the children visiting China

When asked the question "how often do you take your child to China?", a total of sixty parents provided their responses as follows: "every year" (n=4, 6%), "every one to two years" (n=23, 38%), "every two to three years" (n=14, 23%), "every three to four years" (n=10, 18%), and "every four years and above" (n=9, 15%). This parameter correlated with several of the children's speech proficiency parameters:

- Total number of errors, $r(60)=-0.279$, $p=0.031$;
- Total number of phonological errors, $r(60)=-0.307$, $p=0.017$;
- Total number of tone errors, $r(60)=-0.273$, $p=0.035$; and
- Average number of pauses per utterance (speech fluency), $r(60)=-0.271$, $p=0.037$.

The results indicated that the children made fewer errors in general (i.e., fewer phonological and tone errors) and produced fewer pauses in their speech if they visited China more often.

Children's accounts of their communication in Mandarin during their visits to China

Except for three children who could not recall their Mandarin language experiences in

China because they went there at a young age, most of the children (57 out of 60) responded to the question "did you have problems understanding, speaking, and reading in Mandarin and writing in Chinese while you were in China?". Their answers were summarized in table 4.32.

Table 4.32

Children's problems in Mandarin language during their visits to China (as reported by the children)

Mandarin language problems experienced by children in China/child responses	Yes	No	Total
listening comprehension	17 (30%)	40 (70%)	57
speaking	22 (39%)	35 (61%)	57
reading	46 (81%)	11 (19%)	57
writing	51 (89%)	6 (11%)	57

Whether the children have problems understanding Mandarin while visiting China

Most of the children (40 out of 57) stated that they had no problems understanding Mandarin while visiting China (see table 4.32). This parameter correlated with a few of the children's Mandarin speech proficiency parameters:

- Total number of different Chinese words (vocabulary size), $r(57)=0.270$, $p=0.042$;
- Total number of different verbs, $r(57)=0.368$, $p=0.005$;
- Average number of words per second (speech rate), $r(57)=0.294$, $p=0.027$; and
- Average number of English code-switches per utterance, $r(57)=-0.278$, $p=0.036$.

Whether the children have problems speaking Mandarin while visiting China

More than half the children (35 out of 60) indicated that they had no problems speaking Mandarin while visiting China (see table 4.32). This parameter correlated with several of the children's Mandarin speech proficiency parameters:

- Average number of words per utterance (utterance length), $r(57)=0.314$, $p=0.017$;
- Total number of different final particles, $r(57)=0.321$, $p=0.015$;
- Average number of words per second (speech rate), $r(57)=0.418$, $p<0.001$;
- Average number of pauses per utterance (speech fluency), $r(57)=-0.267$, $p=0.045$;

- Average number of English code-switches per utterance, $r(57)=-0.444$, $p<0.001$; and
- Length of English code-switches (in words), $r(57)=-0.341$, $p=0.010$.

Whether the children have problems reading Mandarin while visiting China

Most of the children (46 out of 60) reported that they had problems reading Mandarin while visiting China (see table 4.32). This parameter correlated with some of the children's Mandarin speech proficiency parameters:

- Total number of Chinese words, $r(57)=-0.265$, $p=0.047$;
- Average number of words per utterance (utterance length), $r(57)=-0.316$, $p=0.016$;
- Total number of clauses, $r(57)=-0.335$, $p=0.011$; and
- Average number of words per second (speech rate), $r(57)=-0.367$, $p=0.005$.

Whether the children have problems writing Chinese while visiting China

Most of the children (51 out of 60) reported that they had problems writing Chinese while visiting China (see table 4.32). However, no correlations were found between this parameter and the children's Mandarin language proficiency parameters.

As seen, most of the children had no problems in understanding and speaking Mandarin, but they had problems in reading Mandarin and writing Chinese during their visits to China. In addition, the results showed a covariance between the children's Mandarin language proficiency and whether they experienced problems in understanding, speaking, and reading in Mandarin as well as writing Chinese while they visited China.

More specifically, the language challenges that the children faced while they visited China were described by them as follows: "they have no idea how to read and write because reading and writing Chinese are too hard since Chinese characters look similar and they do not have enough practice reading and writing Chinese" (twenty-four responses), "they have no idea what new words they have never heard, seen, or learned mean" (fourteen), "they only know a little or a few Chinese words" (nine), "they forget or cannot recall how to read or use the exact words" (eight), "they find Chinese accents challenging to understand" (eight), "they feel concerned about using hard and complex words" (six), "they have no idea how to pronounce some words, such as the /ch/ sound, and how to order sentences correctly with proper grammar" (five), "they find long and complex sentences difficult to understand" (five), "they are unable to read without the support of Pin Yin"

(four), “they are unable to comprehend dialects” (four), “the Mandarin speakers’ speaking speeds are too fast” (three), “they only know how to speak and have no idea exactly what Mandarin speakers talk about” (two), “they only understand what their family members say in Mandarin and cannot understand Mandarin speakers from outside the family” (two), “he/she cannot understand the words that are rarely used in the daily speech” (one), “he/she is confused about homonym words, e.g., the word “ji yi” both pronounced with the fourth tone, which means different things when used with different Chinese characters, such as “记忆/ji4yi4 (remember)”, or “技艺/ji4yi4 (arts, skills)” (one), “he/she is unsure about big words” (one), “he/she is unable to understand poems, idioms, or proverbs” (one), “he/she is unable to understand some Chinese traditional and typical cultural customs” (one), and “he/she feels shy while speaking Mandarin” (one).

4.5 Summary of the Language Practices that Contribute to Mandarin Heritage Language Maintenance and Proficiency

All the information provided in this section was collected from the responses by the parents in the questionnaire and by the children in the interview.

4.5.1 Language practices reported by the parents

This subsection described the methods that the parents usually adopted for teaching their children Mandarin at home and outside the home, the activities they usually undertook to improve their children’s Mandarin language proficiency, and the measures they recommended for the Saskatchewan government and educational institutions to maintain Mandarin Chinese within Saskatchewan and in Canada.

Methods that the parents usually adopt for teaching their children Mandarin at home and outside the home

When asked the question “what methods do you usually use for teaching your child Mandarin at home and outside the home?”, a total of sixty parents provided their answers. The most frequent answers were: “provide Mandarin TV, animations, or movies” (forty-eight responses), “use Mandarin to tell stories” (thirty), “read Chinese printed materials in Mandarin, like Chinese storybooks, fairy-tale books, textbooks, poems, newspapers, or magazines” (thirty),

and “use Mandarin in daily communication” (twenty-eight). A less frequent group of responses included “listen to Mandarin music, and sing Mandarin songs with their children” (fifteen responses), “take their children to meet with friends who speak Mandarin, and encourage their children to make friends and play with peers who speak Mandarin” (fifteen), “bring their children to participate in the activities held by Chinese communities, such as Chinese gym, concert, Chinese singing or dancing club, or Chinese summer or winter camp” (fifteen), “bring their children to visit places where Mandarin is spoken, i.e., Chinese church, restaurants, or stores” (twelve), and “use Mandarin outside the home, i.e., explaining the meaning of the goods in Mandarin while shopping or describing the things in Mandarin when children see Chinese advertisements, tags, or menus” (eleven). The least frequent responses were: “send their children to Mandarin language classes (eight), “find Mandarin learning resources online, such as from YouTube or Mandarin websites” (six), “call or chat in Mandarin with relatives who live in China” (five), “encourage their children to teach English speakers Mandarin, or play as a English-Mandarin translator” (three), “create Chinese immersion environments, such as playing Chinese CDs in Mandarin at home or in the car” (three), “insist on speaking Mandarin all the time at home and outside the home” (three), “try to increase their children’s interests in the Mandarin language by introducing Chinese history or culture” (two), “supervise children’s Mandarin language assignments” (two), “teach Pin Yin, e.g., ask children to recognize Pin Yin and teach children how to read Pin Yin correctly with four tones” (one), “take children to visit China” (one), “celebrate Chinese festivals” (one), and “play Chinese games” (one).

Activities that the parents usually undertake to improve their children’s Mandarin language proficiency

When asked the question “what activities do you usually conduct for improving your child’s Mandarin language proficiency?”, a total of sixty parents provided answers. The most frequent answers were: “take their children to visit China to travel, visit family members, or participate in Mandarin language training programs” (eighteen responses), “use Mandarin in daily conversations” (sixteen), “use Mandarin to read Chinese storybooks, fairy-tale books, textbooks, or literature-related materials with their children” (fourteen), “take their children to engage in activities where Mandarin is used” (thirteen), “send their children to Mandarin heritage language schools” (ten), “use Mandarin media at home, i.e., Mandarin TV or movies” (nine), “take their children to meet

with friends who speak Mandarin and let them play with peers who speak Mandarin" (nine), and "take their children to visit places where Mandarin is spoken, such as Chinese churches, restaurants, stores, or houses of friends who speak Mandarin" (eight). A less frequent group of answers were: "use Mandarin learning materials provided online, i.e., Apps, videos, or DVDs" (five), "use Mandarin-only language policy at home" (four), "encourage their children to chat with relatives who speak Mandarin only" (three), "translate between English and Mandarin" (three), "listen to Mandarin music, and sing Mandarin songs with their children" (three), "use Mandarin when playing games with their children" (two), "suggest teaching Mandarin at home, especially when their children are young" (two), and "design interest-oriented activities in Mandarin for their children" (two).

Measures that the parents recommend to the Saskatchewan governments and educational institutions to maintain Chinese as a heritage language in Saskatchewan and in Canada

A total of sixty parents responded to the question "what measures do you recommend the Saskatchewan government and educational institutions take in order to maintain Chinese as a heritage language within the province and in Canada?". The most frequent responses were: "more funds and financial support should be provided for Chinese heritage language education and for Chinese communities to hold cultural activities" (thirty-one responses), "more Chinese language and culture activities should be held in order to attract children's interests in learning Chinese, such as Chinese storytelling, singing, or painting competitions" (eighteen), and "Mandarin language classes should be added into public schools' education systems, e.g., increasing Mandarin language classes in afterschool programs or elementary schools, or establishing Chinese language immersion programs and opening Chinese-English bilingual schools" (sixteen). Their less frequent responses were: "Mandarin should be used as a supplemental language in public serving places (e.g., banks and driver-license testing facilities), and more Mandarin language resources should be introduced into public libraries for reading and borrowing, such as Chinese movies or books" (seven), "Chinese traditions and cultures should be preserved in cities by building more connections with Chinese people and celebrating Chinese festivals" (five), "the quality and the training of Chinese language teachers should be strengthened" (four), "Mandarin media should be designed and set up for children, i.e., Chinese radio or TV channels" (four), "the tuition fee for learning Chinese should be decreased" (two), and "Chinese language classes should be settled for younger kids who are

below the age of five" (two).

4.5.2 Language practices reported by the children

The children's reports about their language practices included how Mandarin Chinese was taught at home and outside the home and the methods that they themselves preferred to use for learning Mandarin.

Children's Mandarin learning at home

In response to the question "do you learn Mandarin at home?", most of the children (57 out of 60) answered "yes", and the other three replied "no".

In addition, the children (57 out 60) who learned Mandarin at home answered the question "from whom do you usually learn Mandarin at home?". Their responses were: "mother" (n=24, 42%), "father" (n=7, 12%), "parents/both mother and father" (n=21; 37%), "grandparents" (n=3, 5%), and "self" (n=2, 4%).

When they were asked the question "how does this family member usually teach you Mandarin at home?", the children's (57 out of 60) most frequent responses were: "by reading Chinese text-books and stories in Mandarin with me" (twenty-six responses), "by reading Chinese characters with me and asking me to write those characters and read them aloud" (twenty-three), "by teaching Chinese writing to me, practising Chinese characters from textbooks or exercises books, and training me strokes" (nineteen), "by playing word-card games with me and asking me to recognize the Chinese characters from those cards" (twelve), and "by using recitations and dictations to evaluate my Mandarin learning progress" (twelve). The less frequent answers included: "by supervising or assisting my Mandarin language assignments" (seven), "by providing Mandarin TV channels, or movies with Chinese subtitles" (seven), "by asking me to identify Pin Yin and tones from Chinese textbooks" (seven), "by taking me to participate in Mandarin-related activities, e.g., Chinese story time, Chinese martial arts, or singing classes" (six), "by introducing online Mandarin learning resources, i.e., Chinese Apps or websites" (six), and "by correcting and clarifying my inappropriate use and misperceptions of Mandarin language" (five). The least frequent answers were: "by asking me to repeat when learning homonym or new words" (four), "by playing Chinese games in Mandarin with me, e.g., Mah-jong or Abacus" (four), "by practising calligraphy with me" (three), "by teaching me Chinese poems and traditional customs" (three), "by

asking me to use a Chinese-English dictionary" (two), "by asking me to write down unknown words in notebooks and reviewing those words after learning them" (two), "by using formal phrases when speaking to me" (one), "by conducting a one-day one-new-word Mandarin learning policy" (one), "by asking me to practice writing Chinese names on my own" (one), and "by asking me to call or use skype in Mandarin with my relatives who live in China" (one).

Children's Mandarin learning outside the home

In response to the question "do you learn Mandarin outside the home (excluding Mandarin heritage language schools)?", one third of the children (17 out of 60) stated "yes", and the others (43 out of 60) replied "no".

The children (17 out of 60) who learned Mandarin outside the home also answered the question "from whom do you usually learn Mandarin outside the home (excluding Mandarin heritage language schools)?". Their responses were: "friends who speak Mandarin" (n=10, 59%), "classmates who speak Mandarin" (n=5, 29%), and "Mandarin speakers met outside the home" (n=2, 12%).

In addition, when they were asked the question "how does this person usually teach you Mandarin outside the home (excluding Mandarin heritage language schools)?", seven (out of seventeen) of the children could not remember the details, and eleven (out of seventeen) children provided their answers as follows: "they only use Mandarin when speaking to me" (six responses) and "they only use Mandarin when playing with me, calling my name in Mandarin, and using Mandarin when singing or drawing together" (five).

Mandarin learning methods that the children prefer

A total of sixty children responded to the question "how do you want to learn Mandarin?", their most frequent responses consisted of: "watching Mandarin TV shows, animations, or movies" (eighteen responses), "playing games with parents or friends in Mandarin, i.e., Chinese chess or Abacus" (sixteen), "using interesting teaching methods, such as recognizing animals' pictures in Mandarin, playing vocabulary cards, or practising writing in the square work book" (sixteen), "learning Mandarin through online media, i.e., Apps via IPAD, online learning resources from websites, or videogames" (thirteen), "playing with friends, peers, or classmates who speak Mandarin" (twelve), "reading Chinese storybooks, textbooks or poems in Mandarin" (nine), and

"using Mandarin in daily conversations" (nine). The less frequent responses involved: "participating in the activities or events where Mandarin is largely used, i.e., Chinese calligraphy, dancing club, Chinese story-time, or camping" (seven), "learning Mandarin by avoiding boring stuff, i.e., long-time (maximum 2 hours per day) or too much repetition and homework" (five), "conducting translations between English and Mandarin, such as through English-Chinese dictionaries" (five), "listening to Chinese music and singing Chinese songs in Mandarin" (five), "recognizing Pin Yin" (three), "learning Mandarin with encouragement" (two), "visiting China" (two), and "sharing ideas or thoughts with parents in Mandarin" (one).

CHAPTER 5
DISCUSSION AND CONCLUSION

This section discusses the language(s) that the parent and the child participants use and that the child participants are exposed to in the domains of the home and family, heritage community, and heritage language schools. It also re-examines the attitudes of both the children and their parents to heritage language and culture in this study as compared to earlier research. Besides, parents' heritage language policies are juxtaposed with the children's opinions of these policies to get additional insights into the efficiency of different strategies and tactics of family language planning strategies and tactics. In addition, this section, explores in more detail correlations between heritage language proficiency and the individual and contextual factors that different families have put in place to aid in their children's heritage language acquisition and maintenance.

5.1 Mandarin Heritage Language Proficiency Compared across the Groups of the Bi/multilingual and Monolingual Children

Mandarin heritage speakers' ultimate attainment of Mandarin heritage language proficiency, as noted by He (2015), typically does not develop "the full range of phonological, morphological, syntactic, pragmatic, and discourse patterns" (p.579) in a way that would allow them to use their heritage language as a native speaker would. He (2015) also shows that, while Mandarin heritage speakers do have a wide range of oral and literacy skills, their syntax is simplified, they frequently code-switch between Mandarin and English, and their literacy skills are limited.

By contrast, heritage bi/multilingual children's English language proficiency, at least based on parents' self-reports in our study, is "native-like" and much better than their Mandarin language proficiency. Multiple other earlier studies (Au et al., 2002; Benmamoun et al., 2013; Tao & Taft, 2017; Gatti & O'Neill, 2017, 2018; Sun, 2019) have described heritage speakers as 'receptive bilinguals' or 'overhears'. Results presented in this research confirms that heritage bi/multilingual children's ability to speak and aurally understand Mandarin significantly surpass their abilities to

read and write in Mandarin. According to parents' self-reports in the study, the bi/multilingual children's Mandarin speaking and listening ability ranges from "good" to "moderate"; however, their Mandarin reading and writing ranges from "poor" to "not at all". These limitations, as suggest by He (2015), are often the result of too little exposure to Mandarin books and writing. Similarly, this research demonstrates that the children who participated in the study rarely practise reading and writing in Mandarin at home.

Comparison of Mandarin speech proficiency parameters between the bi/multilingual and monolingual children

Mandarin speech proficiency was evaluated via a narrative (storytelling) task in which objective Mandarin speech proficiency parameters were extracted from the children's speech samples and compared between heritage bi/multilinguals and Mandarin monolinguals in China. The results of the comparison between the bi/multilingual and monolingual children across the two age groups (ages 5 to 7 and ages 10 to 12), are consistent with earlier studies (e.g., Hoff, 2006; Montrul, 2008, 2010; He, 2015; Kupish & Rothman, 2018; Polinsky & Scontras, 2020; Giguere & Hoff, 2020) that demonstrate that bi/multilingual children lag behind their monolingual peers when just one of their languages is assessed. Also, the results of this thesis research are in line with the findings of Hipfner-Boucher et al. (2015) that the significant differences between bi/multilingual and monolingual children are mainly in the "lexical and morphosyntactic domains of narrative structure" (p.679), especially in the measures of "productivity, lexical diversity, linguistic complexity, and grammaticality" (p.680). When compared to the monolinguals, the bi/multilingual children in our study acquire a smaller number of words and obtain fewer different lexical items (such as fewer diverse nouns, verbs, grammatical particles and phrases), which is extremely common among Chinese heritage speakers (Jia et al., 2005; Yip & Matthews, 2007; Cheung, 2008; Wang, 2013; Gao, 2014; He, 2015; Zhang & Koda, 2018).

In terms of grammar acquisition, earlier studies (He, 2010, 2015; Hoff & Core, 2015; Jia & Paradis, 2015) have indicated that the grammatical development of bi/multilingual children may behind that of monolinguals. For instance, heritage speakers (heritage bi/multilinguals) often under acquire grammatical structures, a finding that has already been discussed in many studies (Benmamoun, 2013; Scontras et al., 2015; Montrul, 2016, 2018; Polinsky, 2018; Aalberse et al., 2019; Polinsky & Scontras, 2020). Chinese-English bilinguals also face challenges in regard to the

complexity of the Mandarin morpho-syntactic system (Ming & Tao, 2008; Woon et al., 2014; Tsoi et al., 2019). In line with these earlier findings, the present research, as compared to the monolinguals, the bi/multilingual children produced a higher number of simple sentences and incomplete sentences, and they also made more linguistic errors in general, as well as in grammar, lexicon, and tone. The types of grammar errors in the Mandarin speech of bi/multilingual children found in our study are very similar to those earlier observed, such as errors relating to the resultative verb compounds (Li, 2013; Tham, 2015), the bǎ or bèi construction (Shi, 2010; Yao, 2014), relative clauses (Lin, 2014; Yao & Renaud, 2016), and word order (Jiang, 2009; Huang, 2018).

The lexicon is a critical aspect of language development, linking with grammar, phonology, and literacy development (Sheng et al., 2011; Wewalaarachchi et al., 2017). As noted in earlier studies (Person et al., 1993; Peña et al., 2002; Hammer et al., 2008), bilingual children's lexical development and their overall conceptual vocabulary may be equivalent to the total vocabulary of their monolingual peers at early stages of language development. However, as the children grow older, their heritage vocabulary development is restrained by the impact of English education and environment. Similarly, in terms of Mandarin-English bilinguals in our study, their lexical diversity and lexical-semantic skills in Mandarin are relatively underdeveloped as compared to monolinguals. However, we can also observe well developed 'coping mechanisms' by the language learners, such as using 'semantic substitution' and 'general-all-purpose' words, to address lexical retrieval challenges and to compensate for a limited vocabulary size, as shown in earlier studies (Sheng & McGregor, 2010; Greene et al., 2014; Sheng, 2014; Barbosa et al., 2017).

Regarding children's phonological development, both biological and environment factors are interrelated with the process of sound acquisition (Li, 2012). With aging, a decrease may occur in sensitivity to lexical tones along with an increase in sensitivity to vowels and consonants (Singh et al., 2015). The rates of speech acquisition are known to be directly related to the children's exposure to a particular language (Li, 2012). For instance, the process of acquisition of Mandarin vowels, consonants, and tones differs from learning English (a non-tone language) (Wiener & Turnbull, 2016). As compared to Mandarin monolinguals, Mandarin-English bilingual children, have to reconcile competing pitch functions while processing spoken words in either language, rejecting tone substitutions in English but remaining sensitive to tone substitutions in Mandarin (Wewalaarachchi et al., 2017). In terms of the phonological errors in Mandarin produced by bi/multilingual children in our study, these problems, according to He (2015), may be caused by

the linguistic features of English or the other languages the children are in contact with (such as dialects), the mixture of linguistic influences resulting in "complex stress and intonational patterns, syllable structures, tones, and pitch contours" (p.583) in their Mandarin speech. It would be meaningful for future research to fully explore what sociolinguistic factors contribute to the bi/multilingual children's heritage language' phonological acquisition and development, due to the 'multidimensional' or 'complex' nature of bilingual children's experiences, especially in a minority or immigrant context (Li et al., 2020). In addition to those grammar, lexicon, and phonology defects shown in the bi/multilingual children's Mandarin speech production, our study also indicates that they had a lower speech rate and speech fluency than their monolingual peers. This confirms Aalberse et al. (2019)'s finding that, in general, the speech rate of heritage speakers is always slower than that of native speakers.

As for code-switching, as He (2015) points out, it is common among heritage speakers of Chinese and other languages (Wei, 2005; Zirker, 2007; Wei & Wu, 2009; Sheng, 2014). Our study agrees with He (2015) that Chinese heritage speakers likely code-switch, both 'intersententially and intrasententially', since they are primarily exposed to oral English and Chinese. However, our study also suggests that bi/multilingual children's code-switches may occur not simply because they are able to spontaneously and effortlessly switch between languages (He, 2015) but because heritage speakers either do not know the Chinese word they require or just cannot remember it (Wei & Liu, 2020), such as their code-switch samples "它得到了那个 prize 和 medal," "兔子很 surprise," or "小鸟很 worry." It is worth noting that in our study, only children with relatively lower Mandarin heritage language proficiency code-switched to English. The age group in our study appears to be a factor in code-switching too. In the older age group (10 to 12 years old), 17 (out of 30) children code-switched, as compared to the younger age group (5 to 7 years old), just 9 (out of 30) code-switched. The number of code-switches increases with age, since the children's exposure to English-language-dominant schooling as well as to English-medium social networks grows with years (Miller, 2017).

5.2 Mandarin Heritage Language Maintenance among the Bi/multilingual Children

In general, the bi/multilingual children in our study showed their success in Mandarin

heritage language learning, which is demonstrate by the selected parameters in the Mandarin speech of the bi/multilingual children that are indistinguishable from Mandarin monolinguals in China. It has been suggested that vocabulary size together with grammar development is normally considered to be a major parameter and a reliable measure for assessing the linguistic capacity of the bilingual children at young ages (Li & Bowerman, 1998; Hoff & Core, 2015; Scontras et al., 2015; Altman et al., 2018; Montrul, 2020; Sun et al., 2020). Among these parameters, lexical diversity (richness) and utterance length have been widely relied upon to examine children's language ability and development (O'Toole & Fletcher, 2010; Heilmann et al., 2016; Gharibi & Boers, 2019; Sun & Verspoor, 2020).

Comparison of bi/multilinguals versus monolinguals across ages 5 to 7 and ages 10 to 12

When comparing the Mandarin speech of the bi/multilingual and monolingual children from ages 5 to 7, our study finds that the lexical development of the bi/multilingual children is overall comparable to that of Mandarin monolinguals in China. Surprisingly, out study notes that the total number of Chinese words produced by the bi/multilingual children (from ages 5 to 7) is significantly higher than that of their monolingual peers. In addition, the bi/multilingual children (from ages 5 to 7) obtained a relatively larger vocabulary size, such as more different classifiers and particularly final particles which show significantly more than those of the monolinguals. Classifiers and final particles are not just a measure of vocabulary development but also an indicator of grammatical development, which has been identified by other studies (Taguchi et al., 2017; Kan, 2019; Yan, 2020). Moreover, our study shows that the total number of utterances spoken in varied ways by the bi/multilingual children (from ages 5 to 7) is significantly higher than those of their monolingual peers, which can be explained by the child participants' report that they try different ways to respond in Mandarin even if they feel challenges when replying to Mandarin speakers. It may appear a little puzzling that on occasion, the younger bi/multilingual children outperform monolinguals in those proficiency parameters; however, similar unexpected 'bilingual advantage' for young children's heritage language speech performance was also observed earlier (i.e., Makarova & Terekhova, 2017). These differences could be explained by overcompensating by the immigrant parents who are making special efforts to teach Chinese to their children overseas, such as providing accessible printed and online Chinese language materials, or ensuring that children have Mandarin-speaking playmates. By contrast, in China, some of the parents may be

talking with children at home in local Chinese dialects (i.e., Wuhan dialect in Hubei province), which may make children underperform a little in Mandarin while they are still in the first years of elementary school. It is also possible that the parents of bi/multilingual children are more educated than those in the monolingual group, as high level of education would be required for immigration to Canada. On the other side, our study also suggests that 5- to 7-year-old bi/multilingual children's acquisition of different nouns and verbs is significantly lower, and their production of simple sentences and incomplete sentences and their errors, particularly lexical and grammatical errors is significantly more than their monolingual peers.

When comparing the Mandarin speech of the bi/multilingual and monolingual children from ages 10 to 12, it is not surprising to see that the bi/multilingual children produced significantly more simple sentences and incomplete sentences than their monolingual peers. While our study shows that the 10- to 12-year-old bi/multilingual children's utterance length (measured via average number of words per utterance) is longer (despite insignificantly) than their monolingual peers, likely due to their acquisition of Chinese words at their younger ages, and based on their reports in the interview, they try to use different ways to respond in Mandarin (rather than shifting to English) even if they feel challenges when replying to Mandarin speakers. On the other hand, it is also plausible that the older monolingual children could use more concise words or sentences to express their ideas, whereas the older bi/multilingual children (due to the incomplete/limited acquisition of Mandarin) have to use more words or sentences in order to describe the same ideas. Notably, our study also finds that the bi/multilingual children (from ages 10 to 12) produce significantly fewer segmental errors than the monolinguals, probably because older monolingual children (from ages 10 to 12) receive relatively more Hubei dialects through their increased social connections with the outside as they grow older, such as the Wuhan dialect mostly spoken in Wuhan city, Hubei province, where the words like "吃/chi1" is pronounced as "qi2", or "是/shi4" is pronounced as "si4". This study also points out that the older monolinguals produce more errors in general, particularly lexical errors which are significantly higher than the younger monolinguals. It could be explained that the number of errors grows with the increasing number of words and sentences produced by the older monolingual. Bi/multilingual children make fewer segmental errors because the number of words or sentences do not significantly grow with their age on the one hand (their chances to make errors are fewer), and their segmental accuracy may be corrected by language teachers while they attend Mandarin heritage language schools or their Mandarin-speaking peers they may meet

or play with at the later time on the other hand. In addition, our study notices that the Mandarin language development of the bi/multilingual children (from ages 10 to 12) is significantly lower than the monolinguals of the same age group, especially in terms of the total number of Chinese words, vocabulary size (i.e., different nouns, verbs, classifiers, and grammatical particles), phrases, total number of clauses, complex and compound sentences, utterances in varied ways, sentence length, tone accuracy, grammatical accuracy, and speech rate and speech fluency.

It should be noted that the influence of the majority language environment, such as public schools that offer English-language-dominant education, is still restricted from ages 5 to 7 since bi/multilingual children only begin school at that age and largely remain at home until they begin attending school (Miller, 2017). As such, Mandarin can be relatively easily maintained as a mother tongue among the bi/multilingual children at younger ages, while Mandarin tends to shift from a mother tongue to a heritage language (a 'weaker' language) later in life due to the increasing amount of time the bi/multilingual children are exposed to the majority language (a 'stronger' language) outside their homes (Polinsky, 2016). Thus, it is not surprising that the bi/multilingual children's Mandarin language proficiency does not develop significantly as they grow older, since they often lack contexts in which to use Mandarin and have insufficient Mandarin input both quantitatively and qualitatively when compared to Mandarin monolinguals in China (Hoff et al., 2012; He, 2015; Hipfner-Boucher et al., 2015; Montrul, 2016; Seo, 2017; Zhang & Koda, 2018; Dye et al., 2019; Tsoi et al., 2019). From my personal experiences with Mandarin in China, I started learning the language in the kindergarten, and was given various opportunities to acquire it through attending diverse classes, such as arts, music, history, philosophy, biology, physics, which would be somehow impossible for the children to learn the language in the same way in Canada.

However, instead of totally shifting to English, the results of our study suggest that the bi/multilingual children (as heritage speakers) do develop Mandarin as a heritage language to some extent. This is confirmed by the fact that the bi/multilingual children at older ages perform, on average, better (although insignificantly) on some of the functional parameters than the bi/multilingual children at younger ages in our study, in particularly vocabulary size, some measure of grammar complexity, or speech rate. Our study demonstrates that the older bi/multilinguals attain relatively a larger vocabulary size, acquire more different lexical items (i.e., more diverse nouns, verbs, classifiers, and grammatical particles), produce a greater number of clauses, sentences, and utterances in varied ways (i.e., longer utterances by applying complex and compound sentences),

and make fewer errors in general (i.e., fewer phonological and lexical errors), and have a higher speech rate than the younger bi/multilinguals. This finding may optimistically help assuage parents' anxieties about whether their children can successfully maintain Mandarin as a heritage language in Canada, though it remains to be seen whether their children can acquire a similar Mandarin language proficiency as a Mandarin monolingual in China.

In comparison to the Mandarin monolinguals in China (from ages 10 to 12), the older bi/multilingual children experience incomplete grammatical development. However, rather than using the term 'incomplete acquisition' that was proposed by Montrul (2008) and describes the 'incomplete' ultimate attainment of the bilingual children's acquisition of the minority language, our study prefers using the term 'differential acquisition' used by Kupisch and Rothman (2018) because it is more suitable for describing the Mandarin heritage language acquisition of the bi/multilingual children in our study. Though the bi/multilingual children seem command lower Mandarin language proficiency than their monolingual peers in general, our study demonstrates that the older bi/multilingual children still perform better than those at younger ages, especially in terms of lexicon and morphosyntax. Thus, it is reasonable to suggest that if the bi/multilingual children take every efforts to learn and develop their Mandarin heritage language, they may effectively maintain Mandarin as a heritage language; however, maintaining their heritage language may be challenging for them (as heritage speakers) because they obtain relatively less Mandarin (as heritage language) input in Canada, particularly when compared to Mandarin monolinguals who live in a rich Mandarin input and use context in China. Moreover, that input, as Kupisch and Rothman (2018) point out, is often restricted both 'qualitatively' due to the limited access to Mandarin formal schooling or literacy training in Canada; and 'quantitatively' because of insufficient contexts to use Mandarin outside the home and family.

Unlike Mandarin monolinguals in China, Mandarin heritage speakers are also impacted by the majority language while they grow up and also by a widely unfavorable environment outside their homes where Mandarin is neither officially supported by the government nor the institutions both in the province of Saskatchewan in particular and in Canada more generally (Cummins, 2006, 2014; Lam et al., 2015; Zhang & Guo, 2017; Duff & Becker-Zayas, 2017; Locher-Lo, 2019). As the parent and child participants' reports make clear, the bi/multilingual children are reported that they usually only use Mandarin with parents and mainly in the home. However, our study believes that it is still possible for bi/multilingual children to attain Mandarin heritage language proficiency

on a par with native speakers at an early age, a finding that has already been demonstrated by many other studies (Benmamoun et al., 2013; Miller, 2017; Kupisch & Rothman, 2018; Makarova et al., 2019; Sun et al., 2020). Furthermore, this tendency that heritage language acquisition has of slowing down can be countered because the differences between bi/multilingual and monolingual children are purely circumstantial, and those discrepancies are expected to vanish if they get a formal education in the heritage language and literacy at an early age and obtain plenty of opportunities, such as living in the country where this language is spoken, to utilise the heritage language later in life (He, 2015; Kupisch & Rothman, 2018).

5.3 Sociolinguistic Factors in the Children's Mandarin Heritage Language Maintenance and Proficiency

Saskatchewan has an English-dominant social and academic environment. In accordance with earlier studies (He, 2010; Reyes, 2012; Elterish, 2016; Budiyana, 2017; Montrul, 2018; Kupisch & Rothman, 2018; Makarova et al., 2019) that have highlighted the significance of the sociocultural context of the bi/multilingualism in heritage language acquisition, maintenance, and development, our study confirms the affect of interrelated sociolinguistic factors in the heritage language preservation and proficiency of the bi/multilingual children, in particular the individual and contextual factors including language attitudes, language use and language exposure in the home (family) and social (heritage community and heritage school) domains.

5.3.1 Individual factors – language attitudes held by the children and their parents

In spite of the fact that the majority language environment does not facilitate heritage language learning, is it still possible for Chinese immigrant parents to instil in their children favorable attitudes towards both Mandarin heritage language learning and preserving the language for future generations? Earlier studies (Li, 1999; Li, 2001; Fishman, 2001; Park & Sarkar, 2007; Zhang, 2010; Hu et al., 2014; Budiyana, 2017; Smith & Li, 2020) have indicated that parents' and children's positive attitudes towards heritage language and their active use of the language within the home environment do support the language acquisition and maintenance, and our study likewise finds that both parents and children support bilingualism.

Children's language attitudes

The attitudes held by individuals play an important role in successful heritage language acquisition, as positive attitudes motivate children to learn the language (Comanaru & Noels, 2009; Miller, 2017). In our study, child participants express positive attitudes towards bilingualism in general, which can be seen in their language preferences. For instance, both Mandarin and English are highlighted by children as the languages they want to speak better, that make them feel more clever, proud, useful, confident, popular, or fun. Most children prefer speaking both languages when they are happy or sad. It is expected that younger children hold positive attitudes towards their heritage language probably due to spending most of their time at home. As children grow older, the connections outside the home, i.e., friends and classmates, strengthen and become more linguistically and socially influential than parents, and children may later develop a preference for English (Fishman, 2013; Tao & Taft, 2017; Rubino, 2021). It is comforting to see that the children in our study reply in Mandarin instead of shifting to English when they feel challenged to answer in Mandarin. They can ask Mandarin speakers for help, check an e-dictionary for a translation, use body language, or even decide trying harder to learn Mandarin.

As compared to the studies of adolescents whose language attitudes are largely affected by the prestige of a language (such as social dominance of English) (Li & Duff, 2018), our results agree more with Miller (2017), who indicates that children's language attitudes rely more on context, such as they clearly understand when, where, and with whom to use specific languages. In our study as well, children demonstrate a preference for Mandarin with parents at home, for either Mandarin or English or both on the playground, and a preference for English with peers at schools. They also choose Mandarin when sharing secrets with Chinese friends in the classrooms, and they know that they need to use Mandarin in China and English in Canada.

Moreover, our study shows that children's like visiting China since they are aware that most of their family members reside there and miss them a lot. This confirms the results of earlier studies (Kwon, 2017; Budiyama, 2017) which underlined that making trips to a country where the heritage language is spoken stimulate youngsters to learn and retain the language, and their desire to maintain proficiency in the heritage language stems from the strong sense of connection to the language's homeland. Not surprisingly, in our study, children also report that they like going to Mandarin Chinese heritage language schools, just as has been noted in earlier research (Zhang & Slaughter-Defoe, 2009; Du, 2017). In particular, the children in our study like attending Mandarin

heritage language schools where they can make friends and play with Chinese peers, and they find learning the Chinese language interesting and fun, with some of them indicate that Chinese writing feels just like painting or drawing.

Parents' language attitudes

It could be expected that children would maintain a positive attitude towards the heritage language both within and outside home in an environment where they may regard their heritage language and culture as a source of strength for a more prosperous future (Zhang, 2004, 2010). The children in our study report that they want to learn Mandarin because they want to work in China and learning Mandarin would make it easier to find a good job in their future career. Moreover, our study confirms the indispensable role of the parents in the development of their children's positive attitudes towards their heritage language, which aligns with earlier studies (Luo & Wiseman, 2000; Liu, 2008). In general, parents in our study report highly positive attitudes towards bilingualism, which is different from some parents' opinions who believe that speaking Chinese would impede their children's English development due to the acquisition of Chinese accent and the incompatible grammar between Chinese and English (Li, 2006). By contrast, in our study, parents feel it is "very important" that "their children can speak Mandarin and English," and they "strongly agree" that "an ability to speak Mandarin and English will contribute to their children's cognitive development and help them to become smarter." In addition, parents decide which language is allowed at home (Miller, 2017), which is confirmed by the fact of our study that parent participants report using Mandarin when speaking to each other, to their Mandarin-speaking friends, and to their children. Besides, our study finds that parents encourage their children to speak Mandarin, and they praise, discipline, and instruct their children in Mandarin, as well as facilitate Mandarin language practices and Chinse cultural activities at home. In addition, our study also notes that parents take their children to visit Chinese venues and engage in Chinese community activities, send them to Chinese heritage schools, and make trips to China. These positive language attitudes have a direct effect on preserving their ethnic group's moral and cultural values, as noted in earlier studies (Wei, 1994; Tse, 2001; Li, 2005; He, 2006, 2015).

The results of our study confirm the positive correlation between the children's heritage language proficiency and positive attitudes, both their own and their parents, towards the heritage language. It is worth noting that children in our study are more likely to attain a larger vocabulary

size with lexical diversity, produce more clauses, sentences, and utterances, have a higher speech accuracy, speech rate and fluency, rarely shift to English, and write more Chinese characters when both parents and children hold positive attitudes towards Mandarin language and heritage. However, it is unlikely that children's heritage language proficiency is directly influenced by their own positive attitudes alone, as earlier studies have indicated that children's attitudes have little bearing on the quantity of exposure and input that they receive in the heritage language (Miller, 2017), whereas positive parental attitudes towards the heritage language may not always translate into a more conducive linguistic environment (Guardado, 2002). In other words, the attitudes must be converted into using the language in an active and positive way and offering a substantive amount of language exposure, as these factors efficiently and effectively support children's heritage language acquisition, maintenance, and development (Montrul, 2008; Place & Hoff, 2011; Carroll, 2017; Kupisch & Rothman, 2018; Unsworth, 2019; Hoff, 2020).

5.3.2 Contextual factors - language use and exposure in the family and home domain

The younger bi/multilingual children in our study display a level of Mandarin language acquisition comparable to the linguistic development of their monolingual peers in China, likely due to a high level of Mandarin language exposure in the families and within the home. As has been shown in other studies (Zhang, 2010; Place & Hoff, 2011; Li & Duff, 2018; Li, 2020), this finding highlights the fundamental role of the parents in promoting children's language skills and proficiency, and parents with positive attitudes towards Mandarin heritage language in our study seem to provide a rich Mandarin language input for their children at home that will be illustrated in the following subsections. It has been suggested that the successful maintenance of heritage language is largely impacted by "family language choice and use" (Budiyama, 2017, p.196), which is also confirmed by our study. Most parents report solely or predominantly speaking Mandarin to their children at home, and, of those parents, both parents and most of the children speak Mandarin in the home. The children in our study report using Mandarin while playing on their own and while communicating with their parents and grandparents.

Parents

Immigrant mothers and fathers are known to contribute to different aspects of heritage language acquisition among second-generation immigrants (Chen & Kang, 2019). Our study finds

that the children acquire more different nouns and achieve higher grammatical accuracy if Mandarin is their mothers' first language; whereas they obtain more diverse verbs, produce longer utterances, and attain higher speech accuracy overall if Mandarin is their fathers' first language. It is worth noting that the earlier identified role of the mother as the primary promotor or custodian of a heritage language (Chen & Kang, 2019; Gogonas & Maligkoudi, 2020) is also observed in our study. However, our study suggests that in future studies more attention should be given to the role of the father's heritage language use, since the father's role has been insufficiently recognized in existing studies (Lee, 2018).

In our study, children's speech accuracy (particularly phonological accuracy) covaries with the mother's use of Mandarin. Based on parent participants' (mostly mothers) reports, mothers always correct their children's mispronunciation to ensure fluent communication between them in the future. Mothers also indicate that they wish they could freely share their emotions, such as happiness or sadness, or their deeper thoughts, such as discussing traditional customs, in Mandarin, since these ideas and thoughts could only be clearly elaborated by them in Mandarin rather than English (as their second language). When examining Mandarin language use between fathers and children, our study finds that children rarely shift to English when speaking to their fathers, and they acquire a larger vocabulary size with diverse lexical items, and speak more complex and compound sentences if they usually speak to their fathers in Mandarin. According to children's interviews in our study, it is their fathers (rather than their mothers) who often use big words or longer sentences (such as complex and compound sentences) because their fathers discipline them (i.e., regarding behaviour rules) or instruct them (i.e., toy installation) at home, and their fathers criticize them if they shift to English when responding to questions. These criticisms could arise probably since fathers often play a decisive role in family language policy and parenting due to the patriarchal family structure that is typical in most traditional Asian immigrant families (Kim & Starks, 2010; Al-Sahafi, 2015), particularly in Chinese immigrant families (Parke et al., 2006).

Grandparents

It is worth noting that children in our study make fewer tone errors if their grandparents speak Mandarin (and not a dialect) as their first language. Our finding aligns with earlier studies (Curdt-Christiansen, 2013; Quay & Montanari, 2016) which indicated that grandparents could invisibly influence children's language socialization. Despite that grandparents often create a

monolingual interactional setting with grandchildren only or mainly in Mandarin (Kheikhah & Cekaite, 2015), our study reveals no correlations between grandparents' use of Mandarin and children's Mandarin language proficiency. Lack of much direct impact of grandparents on children's Mandarin proficiency could be explained by the limited duration of grandparents' stay in Canada (normally only six months and usually less than one year, due to Canadian visitor visa limitations) and the fact that they typically spend most of their time helping with household chores (Quay & Montanari, 2016) rather than teaching Mandarin to children. Based on my personal observation of my daughter's Mandarin speech, her phonological (tone and segmental) accuracy covaries with her grandfather's Foochow dialect (his first language spoken in Fuzhou city, Fujian province of China). Since grandfather is mainly responsible for taking care of my daughter at home (such as spending 8 to 10 hours daily with children while parents work outside and primarily help the housework like cooking, or cleaning), it is not surprising that my daughter copies her grandfather's pronunciation, such as the words "福/fu2" as "福 hu2", or "没/mei2" as "没/mao4".

Siblings

While some studies (Kibler et al., 2014; Bridges & Hoff, 2014; Unsworth, 2016; Sun et al., 2020) have indicated that older siblings tend to change their younger sibling's language use at home by using the societal language once they go to school, our study, like some other studies (Shin, 2002; Hoff et al., 2014; Rojas et al., 2016; Tsinivits & Unsworth, 2021), finds that older siblings at home potentially benefit children's expressive language skills. The results of our study demonstrate that children who prefer to speak English with their siblings are less successful in writing Chinese characters; however, their Mandarin speech proficiency is not adversely impacted, probably because Mandarin is the language most often used in the family by the parents who are the primary caregivers and the main influence on heritage language input within the home, which agrees with some earlier results (Tannenbaum & Howie, 2002; Sun et al., 2018; Kheirkhah & Cekaite, 2015; Budiyana, 2017; Sun et al., 2020). The children in our study report that their older siblings are encouraged by parents to support and help the younger siblings when they attempt to speak Mandarin. It is reasonable to suspect that, based on some earlier studies, immigrant parents may probably be aware of the tendency for older siblings to speak English to younger siblings and its ramifications (Shin, 2002), and thus, they might have already introduced Mandarin-as-family-language-policy at home (Li, 2020), or informed children that maintaining Mandarin as the family

language is important in keeping close connections with older generations or core family members who cannot speak English but Mandarin only (Zhu et al., 2020).

Language input at home

Multiple earlier studies suggest that the extended family members benefit children's heritage language learning and maintenance (Wong Fillmore, 2000; Shin, 2002; Curdt-Christiansen, 2013; Kheirkhah & Cekaite, 2015; Quay & Montanari, 2016; Budiyana, 2017). While according to our study, children's heritage language proficiency depends mainly on whether parents are consistent in their use of the heritage language and take strategies to encourage the language use at home. In consistence with some other studies (De Hower, 2007; Nomura & Caidi, 2013; Tsoi et al., 2019), our investigation confirms that when parents use Mandarin at home and provide a rich Mandarin language and literacy environment, such as offering accessible printed or online learning materials (i.e., Chinese books or multi-media), conducting frequent language practices and culture-related activities at home (i.e., explicit Mandarin teaching or playing Chinese games), and building adequate social networks (i.e., meeting Chinese peers or engaging in Chinese communities), all of these efforts potentially contribute to children's heritage language acquisition and maintenance.

Mandarin media at home

Children's heritage language proficiency is known to positively covary with their amount of interaction with the language through direct communication or book reading as well as with the quantity of heritage language media exposure (Sun et al., 2020). Our study, like others (Velázquez, 2017; Sun & Yin, 2020), confirms that diverse multimedia sources offer important channels for children to receive additional heritage language input and extend heritage language practice, thus promoting children's heritage language proficiency and maintenance at their early stages of language development. Our study shows that exposure to Mandarin media at home not only results in fewer code-switches but also substantially enhances children's lexical development (such as a larger vocabulary size with lexical diversity), production of utterances (such as longer utterances), speech rate and fluency, and ability to write Chinese characters.

However, it should be kept in mind that our study finds that children's speech accuracy covaries with their Mandarin media exposure, such as children's lexical errors covary with watching Mandarin animations, and their segmental errors correlate with playing Mandarin

computer games. This finding could be caused by the fact that multimedia is non-interactional (Sun et al., 2018), which differs from direct speech and interaction, and the fact that the materials adopted in the multimedia are meant for entertainment rather than educational purposes (Sun & Yin, 2020). Based on my personal observation of my daughter, similar issues are noted, for instance, the language used in animations is based on virtual context (such as in fairy tales), which leads to the inappropriate usage in an authentic context, e.g., the word "飞/fly" was misused as "跳/jump" when referring to the activity of "playing trampoline," in which she says "在蹦床上飞/fly on the trampoline" instead of "在蹦床上跳/jump on the trampoline" in Mandarin. Also, non-standard Mandarin pronunciations are often used in Mandarin computer games to attract the child's attention and make them feel connected with the game character's actions, such as the word "死/si4" (dead or lose the game) is pronounced as "xi3," which sounds interesting but misleads the child.

Explicitly teaching Mandarin language skills at home

There is evidence showing that bi/multilingual children's heritage language vocabulary development is boosted by the richness of the home heritage language and literacy environment (Sun et al., 2018), which is also confirmed by our study. Our finding shows that children acquire a larger vocabulary size with lexical diversity, if parents explicitly teach them Mandarin speaking and listening as well as instruct them in Chinese poems, idioms, and proverbs at home. However, no significant impact of explicit language teaching on children's Mandarin literacy development was observed in our study, despite parents claims that they explicitly teach their children Mandarin reading and writing at home. Instead, as long as children spend any time (even if less than one hour a day) practising Mandarin reading and writing at home, our study notices that they seem to attain positive Mandarin literacy outcomes. Our study shows that children's speech rate and ability to write Chinese characters covaries with their practice of reading Mandarin; while their ability to write different and correct Chinese characters relates to their practice of writing Chinese characters. Though the higher levels of productive heritage language and literacy have been noted to promote children's linguistic and literacy outcomes (Rauch et al., 2012; Hao et al., 2019), in our study, a considerable number of child participants do not sufficiently engage in Mandarin reading and writing practices. The reason for this insufficient practice of reading and writing was attributed by He (2008, 2015) to limited time and efforts that Chinese immigrant parents can invest in Mandarin literacy activities.

Mandarin language and culture-related activities at home

Previous findings (McQuillan, 1998; Kondo-Brown, 2006; Xiao, 2008) suggested that children's access to reading materials and the amount of reading activities are critical to developing their literacy, so it is not surprising to see that in our study, children's speech rate and fluency, as well as their ability to write Chinese characters, positively correlates with reading Chinese printed materials (such as storybooks and textbooks). In particular, our study finds that children's phonological accuracy (especially their tone accuracy) closely covaries with the frequency with which parents practice reading in Mandarin with their children, as parents could correct their children's tone errors while reading Chinese books together. In addition, children's heritage language skills and proficiency are better retained and supported if their parents play many different games and activities with their children (Lee & Gupta, 2020; Ehl et al., 2020). Like Xiao (2008), our study also finds that children's acquisition of a larger vocabulary size, production of longer sentence length, and attainment of higher phonological accuracy as well as fewer code-switches correlate with their participation in Chinese culture-related activities at home that are rich in linguistic and cultural content and popular among children (such as playing Chinese chess, or celebrating Chinese Spring Festival). As reported by child participants in our study, they are excited to learn Mandarin through cultural activities, and their Mandarin language proficiency is improved when their parents explain game rules in Mandarin, when they use Mandarin to respond in games such as guessing the meaning of the Chinese words on flash cards, or when they express holiday wishes in Mandarin to their Chinese relatives. All of these activities may have served to create a sustained language input and a pro-Mandarin-heritage-language home environment that instinctively stimulates children's Mandarin language learning.

5.3.3 Contextual factors - language use and exposure in the social domains

The numbers of multiple Mandarin speakers with whom children can interact and the quality of language input are believed to be decisive in children's heritage language acquisition (Gollan et al., 2014; Zhang et al., 2018). All the children, based on their self-reports and parents' testimonies, have at least one though maximum five friends to speak Mandarin with, and all the parents report having mostly Mandarin-speaking friends. It is plausible to assume that what the children lack in terms of a restricted number of Mandarin speakers in their immediate environment,

is made up by the amount and quality of Mandarin language input provided by parents speaking Mandarin at home (at least when there is a strong and supportive Mandarin language policy in the home) and also by encouraging their children to participate in cultural activities or events where they can meet other members of their in-group community (plus also enrolling the children into Mandarin language, as will be discussed later).

Language use and exposure within the Chinese community

The results of our study agree with earlier findings pointing out the vital contribution of a heritage community into creating a heritage language milieu such as in Chinese churches, restaurants, or stores, and Mandarin-language-related activities or events (Dixon et al., 2012; Zhang et al., 2018). These additional contexts of heritage language use facilitate children's heritage language proficiency and maintenance, increase heritage language vitality and enhance the heritage language learners' motivation (Hinto, 2001; Pearson, 2007).

In our study, children's speech rate and their phonological accuracy covaries with visiting Chinese restaurants, probably due to their use of Mandarin when ordering menu items or requesting services in these restaurants. Whereas children's production of complex and compound sentences and their ability to write Chinese characters covaries with visiting Chinese stores, probably due to being exposed to more Chinese characters in stores (such as food labels and advertisements posted in Chinese) and using complex sentences when asking for help to order things and find items. Our study also finds that children's acquisition of different final particles correlates with visiting Chinese restaurants and stores, though it is not surprising that this largely applies to final particles such as "了/le", which is usually used in restaurants and stores in phrases like "我吃饱了/I am full" or "我买好了/I am done with shopping," and "吧/ba", which is used in phrases like "好吧/okay" or "走吧/let's go".

In addition, our study finds that children produce longer utterances and succeed in writing Chinese characters if they engage in the activities or events held by Chinese community. Children are enabled to understand the value of learning Chinese more deeply when they are granted social opportunities in which they can engage in heritage communities in a variety of roles (Zheng & Cong, 2017). Our study also confirms earlier research (Zhang et al., 2017; Budiyama, 2017) demonstrating that building and retaining close relationships with core family members motivates young language learners to preserve their heritage language because it establishes a close

connection to their homeland and cultural roots.

Furthermore, an extended cross-national Chinese community is also conducive to Mandarin language acquisition. It appears that children's speech accuracy (particularly phonological and grammatical accuracy), speech fluency, and fewer code-switches covary with speaking to Chinese relatives (such as by Skype, or Facetime) and visiting them in China. It is not surprising that the children in our study state that they have no problems with Mandarin speaking and listening during their visits in China. This finding re-enforces is a well-known fact that heritage speakers generally have well-developed speaking and listening skills in the heritage language (Gatti & O'Neill, 2017).

Language use and exposure at Chinese heritage language schools

It has been suggested that heritage speakers who can receive significant literacy training in the heritage language as part of their primary education, show little to no linguistic atrophy in their adulthood in comparison to age-matched monolinguals, even in grammatical competence (Kupisch & Rothman, 2018; Polinsky, 2018). The crucial role of Chinese heritage language schools plays in children's Mandarin heritage language acquisition is also confirmed by our study. For instance, our study shows that children acquire a larger vocabulary size with lexical diversity, such as more different verbs, grammatical particles, and phrases, produce utterances in varied ways, command higher speech rate and lexical accuracy, and write more different and correct Chinese characters, as well as rarely shifting to English. While our study is in line with Aalberse et al. (2019) which presents that it still remains to be established whether the input offered by heritage language schools allow children to acquire the heritage language sufficiently and appropriately.

In our study, child participants report using English if communication is irrelevant to academic studies (such as when chatting or playing with peers), while they use both Mandarin and English when discussing schoolwork and subjects. The children who were born in Canada report their preference for using English because they find it difficult to understand Chinese slang or idioms that they have never heard before used by new Chinese immigrant children. By contrast, new Chinese immigrant children report their desire to speak English with those peers who can understand English and Mandarin since those children can help them improve their English by translating between the two languages. It is known that children's heritage language proficiency is closely related to their learning experiences at heritage language schools (Pascual y Cabo et al., 2017); therefore, it is unclear whether children born in Canada should be put in the same level

language classes with children who just emigrated from China. Our concern is that it may not be a good idea to put heritage speakers and Mandarin native speakers in the same level language classes as Canada-born children may become upset or discouraged due to the big difference in their scores (i.e., either in language exams or competition activities) as compared to those children who have recently emigrated from China. However, due to the limited options of Mandarin heritage language schools in small cities like Saskatoon (only three schools provide weekend language classes in Mandarin), children who want to learn Mandarin formally at a younger age (specially before attending Mandarin language classes in high school or university) have to rely on those community-run heritage schools. As Canada-born Chinese children, new Chinese immigrants, and anyone (as long as their ages meet school's requirement) interested in learning Mandarin are all enrolled into Chinese heritage language schools. Mandarin language there is taught, to some extent, more like a second language that accumulates linguistic and cultural capital in the global context (Wong & Xiao, 2010) rather than a heritage language aiming at helping people connect with their identities with the customs, traditions, and ethics of their Chinese heritage (Zheng & Cong, 2017).

On the other hand, the language input quality at schools is dependent on the teacher's qualifications (i.e., heritage language knowledge) (Sun et al., 2020). Our study finds that parents' satisfaction with their children's Mandarin language learning at Chinese heritage language schools ranges between "satisfied" and "unsure (neither satisfied nor unsatisfied)." Overall, parents appreciate the Mandarin learning opportunities offered by heritage language schools, but they have doubts about the language teacher's course design (such as whether the teaching materials used in the class are appropriate for different children's backgrounds, i.e., Canada-born Chinese versus new Chinese immigrants versus Canadians) and concerns about the teacher's qualifications to teach the language (for instance, one of the participant parents mentions that she/he notices the Chinese character "午/noon" is written as "牛/cow" on the blackboard, which completely confuses and misleads her/his child). Most child participants report that they dislike writing Mandarin language assignments, which many of them feel "too hard, too much, or too boring" and one child mentions his/her experiences of being criticized by his language teacher.

Children in immigrant families may suffer emotional pressure to accept English domination as normal and parental involvement in their children's Mandarin language learning may be not always sufficient; thus, consistent educational support may essentially reduce the vulnerability to divergence in children's Mandarin heritage language development (Zhang & Slaughter-Defoe,

2009). Our study, in line with other studies (He, 2015; Randolph Jr, 2017), suggests that heritage language educators, who play such a crucial role in their students' engagement with heritage languages, need to consider how their pedagogical practices can positively or negatively affect their students' perception of the value and agency heritage languages can add to their lives.

5.4 Additional Highlights

5.4.1 Immigrant family background

As a number of studies (Tannenbaum & Howie, 2002; Xiao, 2008; Eriksson et al., 2012; Miller, 2017; Chen & Kang, 2019; Sun et al., 2020) that have contextualized immigrant settings have indicated that, children's heritage language proficiency and maintenance is also affected by various demographic factors such as the child's gender, birthplace, the age of immigration, ability to speak other languages besides Mandarin and English, and parents' education levels.

Gender

In general, at early stages of language development, girls are known to outperform boys, and women typically do better on language tests than men (Coates, 2004). Regardless of their ethnic backgrounds, female immigrant children relatively retain their parental language at greater rates (Eriksson et al., 2012; Chen & Kang, 2019), and, overall, the girls in our study surpass the boys, particularly in vocabulary performance. On average, the girls acquire a larger vocabulary size, produce more longer utterances and complete sentences, and rarely shift to English in comparison to the boys.

Birthplace and the age of immigration

Birthplace and the child's age when they arrive in their new country are significant variables and predictors of heritage language proficiency and maintenance (Montrul, 2008, 2016). For instance, the age of immigration plays an influential role on children's "grammatical and lexical knowledge, processing speed, and acoustic properties of speech" (Birdsong & Vanhove, 2016, p.163). Our study finds that children who were born in China and brought to Canada by the age of three acquire a larger vocabulary size, speak more longer utterances, and make fewer errors overall (particularly lexical errors), as well as attain a higher speech rate than Canada-born children. Our

study also demonstrates that children brought to Canada at the age of three produce more complete sentences, obtain higher grammatical accuracy, and attain higher speech rate and fluency than children who were brought at a younger age. The likely reason for these findings could be that those children born in China are exposed to Mandarin in greater quantities and qualities than those children born in Canada (Jia, 2008; Jia & Bayley, 2008; Xiao, 2008).

Ability to speak additional language(s)

It is interesting to note that children's Mandarin language proficiency is correlated with their ability to speak additional language(s), probably because they may recognize common linguistic forms in the different languages they know (Garthercole, 2016). Our study, on the one hand, notes that children make fewer grammatical errors and rarely shift to English if they can speak Chinese dialects besides Mandarin, likely because these various dialects provide them access to more expansive vocabularies and shared grammatical structures in the dialects (Garthercole, 2016). On the other hand, our study also indicates that children produce fewer classifiers and fewer longer sentences if they speak Chinese dialects, probably due to different phonological forms of dialects as compared to Mandarin (Garthercole, 2016). Other than that, our study shows that children's speech rate is improved if they can speak other language(s) in addition to Mandarin and English, which is in line with the 'linguistic interdependence hypothesis' proposed by Verhoeven (1994).

Parents' education level

It has been indicated that the children of the parents with higher levels of education, especially those with post-secondary degrees and beyond, maintain their heritage language more effectively (Chen & Kang, 2019), which is also confirmed by our study. Our finding shows that children produce more various final particles and write more different and correct Chinese characters if their mothers have achieved at least a bachelor's degree. However, differing from the finding of Chen and Kang (2019) who highlighted a negative association noted between Asian mother's levels of education (such as with a bachelor's degree or higher) and their children's language retention, the positive correlation found in our study is probably because most mothers with bachelor's degrees stay at home and work as housewives as parent participants (mostly mothers) report the limited job opportunities in the small city and the extra financial burden of

hiring a nanny if both parents work outside the home.

In addition, our study presents that children's heritage language proficiency positively relates to parents staying at home, for instance, they produce longer utterances by applying complex and compound sentences, have a higher speech rate, and rarely shift to English. The reason for this finding is likely because children are willing to maintain their parents' mother tongue when there is a closer connection between parents and children (Tannenbaum & Howie, 2002; Tannenbaum & Berkovich, 2005; Ho & Birman, 2010; Hu et al., 2014; Hollebeke et al., 2020).

5.4.2 Bi/multilingual children's Mandarin literacy skills

Literacy is widely recognised as a major promoter of language acquisition and language proficiency (Choi et al., 2018), so parents are right to be concerned about their children's ability to maintain their heritage language if they show poor literacy skills. A remedy to this problem would be for parents to spend more time reading to their children and encouraging them to read. A study of literacy skills among Chinese-speaking immigrant adolescents in the Waterloo Region and the metropolitan Toronto area of Ontario revealed a close relationship between types of acculturation among Chinese ethnic groups in Canada and reading skills (in terms of reading fluency and comprehension) (Jia et al., 2014). Also, as is the case with Zhang et al. (2019) study, which found that the pronunciation of characters via Pin Yin contributes to children's vocabulary knowledge, our study also confirms that Mandarin heritage speakers' access to word pronunciation does facilitate their vocabulary acquisition. Our finding shows that children's vocabulary size and lexical diversity covaries with their ability to read Chinese texts in Mandarin, either with or without the support of Pin Yin, and, as expected, children have a higher speech rate and fluency if they can read without Pin Yin. In other words, without the alphabetic system to facilitate their pronunciation of characters, the children are found obtaining a larger vocabulary size, which helps them read texts more fluently.

In addition, even though reading and writing skills develop together and are connected with one another (Sénéchal et al., 1998) and our study finds a positive correlation between the children's ability to write Chinese characters and the number of words and utterances produced in their speech as well, their writing is often perfunctory and shows little recognition that the symbols they wrote contain any direction and order, similarly to Shim (2021). There is evidence indicating a negative association between Chinese reading skills (such as low literacy skills due to underdeveloped

morpheme-character awareness) and the degree of morphological attrition (resulting from heavily restricted print input and literacy experience) in the oral skills of Chinese-English bilinguals (Koda et al., 2008). It should therefore be noted that memorizing Chinese characters is difficult for young Chinese heritage speakers since they do not have the necessary metalinguistic knowledge about the morphological structure of a Chinese word; and, this difficulty continues into their adulthood, especially when faced with new characters, as they cannot recall the phonological patterns or the semantic meaning about radicals from stored character knowledge (Xiao, 2008; He, 2015).

5.4.3 Chinese immigrant families in Saskatoon

The reversal of language shift can only take place at the familial and communal level (Fishman, 1991; Dixon et al., 2012; Elterish, 2016; Zhang et al., 2018; Sun et al., 2020). Our study confirms the interrelated roles of family and heritage community in children's heritage language acquisition and maintenance. However, when looking at the correlations between the children's heritage language proficiency and sociolinguistic factors, our study finds that children's acquisition of their heritage language is less dependent on the heritage community and Mandarin heritage language schools than on their home heritage language environments and whether their parents use Mandarin at home on a daily basis, have explicit Mandarin language teaching in speaking and listening, and implement language practices and culture-related activities in Mandarin at home. Parents and parental language policies and practice, then, are the most important factor in this child's ability to maintain their heritage language and are integral to the child's appreciation of Chinese identity and the role language plays in this identity. And all of those could explain why the Mandarin Chinese heritage language has to some extent been maintained in the city of Saskatoon, a place with much less ethnolinguistic vitality than other cities such as Vancouver and Toronto in Canada (Statistics Canada, 2016).

As a researcher and mother who is raising a Chinese-English bilingual child and based on my personal observation (such as Appendix K) and communication with the local families in Saskatoon, I can see how hard Chinese immigrant families try to ensure their children learn Chinese as well as English. In the online WeChat group, mothers discuss methods of bringing more Chinese printed materials into the city, and they have suggested everything from renting containers to help ship Chinese books from China to Canada to creating an online book-sharing group that ensures language learning materials are available for children in the city. They also create self-media in

which they share methods that support children's Mandarin learning at home, and they shift their attention to online resources (particularly during the pandemic) such as buying different software designed in China so children could practice reading, listening, and writing. They also try to build a close community by holding activities for Chinese immigrant families such as Chinese story time or small online or in-person groups (i.e., singing, rhythm, Chinese painting) directed and orientated by children's interests, and they organize traditional Chinese festivals ranging from small dinner parties to big New Year Galas while also raising funds for local Chinese Radio and heritage schools. Though some families have to leave the city due to the chilly weather and because they want to provide a better educational environment for their children, they still keep close contact with the families here and share resources they could find in bigger cities like Calgary, Edmonton, Vancouver, or Toronto to support the families here.

The survival of Mandarin as a heritage language in Saskatoon is also aided by the fact that most mothers indicate they have to stay at home because the job opportunities in Saskatoon are very limited and require good English communication skills and/or Canadian education certificates. Additionally, the long waiting lists of attending daycare and the high costs of hiring a nanny mean that children's Mandarin language could be maintained thanks to their mothers being able to contribute their time to language teaching. However, attention must also be paid to the number of new Chinese immigrant mothers who focus on helping their children successfully and positively adapt and acclimate to their new environment, and who are, at this time, more concerned about children's English language proficiency and schoolwork than with their heritage language development. They raise concerns that they feel anxiety about the first few years after immigrating to Canada, as they notice that their children are very quiet, which is probably due to the dilemma of living in two languages (Wong Fillmore, 2000; Xiao & Wong, 2014). Thus, future research on bi/multilingualism needs to pay attention to those children who struggle with maintaining their heritage language and acquiring English as a dominant and social language at the same time, and to families who do not know how to raise a bi/multilingual child and need the guidance and support to facilitate the acquisition and maintenance of heritage language by their children, especially when their children get older and receive more English input.

It would also be useful if future research to focus on the impact of COVID-19 on children's heritage language acquisition and proficiency. In particular, it is well worth investigating how online tools can be appropriately and efficiently used for learning and maintaining heritage

languages, since many mothers indicate that their children's Mandarin language proficiency seems to be positively enhanced by attending online courses during the pandemic. Recent research studies, such as Bao et al. (2020), Garbe et al. (2020), Szente (2020), Wheeler & Hill (2021), or Lee et al. (2021), also highlighted the positive influence of COVID-19 on children's language and literacy development (i.e., oral and reading skills) due to the increased interactions between parents and children. Thus, it would be productive development for future research to examine parents' and children's attitudes to Mandarin online learning and any other efficient and effective inputs they have used during the pandemic.

5.4.4 Recommendation and practical application

This thesis investigated the speech development of Mandarin-English bi/multilingual children (Mandarin heritage speakers or the second-generation immigrant children from Chinese-speaking immigrant families) in Saskatchewan. The study included the factor of age and the sociolinguistic factors (language attitudes, language use, and language exposure). This is the first study in Saskatchewan examining the maintenance and proficiency of Mandarin Chinese as a heritage language by bi/multilingual children.

The recommendations and practical applications for immigrant families, heritage language schools, and the government and educational institutions are summarized as follows:

- Mandarin Chinese could be maintained as a mother tongue by the bi/multilingual children at their young age as they are on par with their monolingual peers at the ages 5 to 7. However, Mandarin Chinese is likely to shift to a status of heritage language at the ages 10 to 12. The linguistic proficiency of the bi/multilinguals at this age does not indicate a significant improvement from the earlier age, and is lower than the one of monolingual peers. Thus, in the Saskatchewan Canadian context, the age between 8 and 10 is established in our study as the threshold for Mandarin language shift from a mother tongue to a heritage language. Some earlier studies hypothesized that the ages 8 to 10 could be 'a likely age of language fixation' (Köpke & Schmid, 2003; Montrul, 2008, 2016).
- Though family and community both play significant roles on bi/multilingual children's heritage language acquisition and maintenance, our study confirms that family plays a decisive role in this process. Bi/multilingual children's success in acquiring and

preserving heritage language is primarily attributed to a sustained and supportive family/home language environment, such as parents insisting on children speaking Mandarin. Notably, our study finds that children's heritage language proficiency is stronger affected by their fathers' language use than mothers'. The influence of grandparents is relatively limited and siblings are noted as the possible facilitator toward maintaining heritage language due to a pro-heritage-language-home-environment. Our study shows that bi/multilingual children in general held positive attitudes towards heritage language, which is crucially related to parents' efforts, such as encouraging children to keep close relationships with family members in China (calling relatives, or taking children visiting China), or creating varied Mandarin language input at home (e.g., providing accessible Mandarin media, teaching Mandarin language skills, or holding Mandarin-related language and culture activities like reading Chinese storybooks, or celebrating Chinese traditional festivals). Yet, parents should pay more attention to children's Mandarin literacy skills, as reading and writing skills are found less developed than their speaking and listening. Furthermore, to facilitate rearing Mandarin-English bilingual children, the balanced heritage (Mandarin) and dominant (English in SK) language strategies are suggested, e.g., providing dual-language books, or attending dual-language programmes (Lindholm-Leary, 2001), or one-parent-one-language family language policy (Barron-Hauwaert, 2004).

- The suggestions for heritage Chinese language schools are as follows. On the one hand, the schools would benefit from more attention on adopting innovative teaching strategies in class in order to accommodate two different groups of children: the ones born in China and brought to Canada around or past elementary school age, and Canadian-born (or brought to Canada as small children). Different goals, tests and competition need to be set for these two types of children in order to accommodate the learner needs of Canadian-born or Canadian-raised children whose exposure to Mandarin from childhood was much less than of the kids raised in China during their young formative years. On the other hand, heritage language teachers' qualifications should be expanded to account for diversity and specifics of children's heritage language learning experience. In addition, to effectively support and promote the learning of Mandarin among children, the application of multimedia and child interest-

orientated activities are recommended.

- Based on the most frequent responses provided by the parent participants in our study, Chinese immigrant parents request more funds from the government to support local Chinese heritage language schools, to access more printed and online resources in the public libraries as well as to facilitate Chinese cultural events and activities in the city, especially the ones directed and designed based on children's interests and needs. The parents also expressed a wish to add Mandarin Chinese language classes into education system beginning from pre-school and elementary levels. Furthermore, the Canadian government should be investing into multilingualism, as numerous studies (such as Cummins, 1992; Garcia, 2009; Blackledge & Creese, 2010; Duff, 2015; Dash, 2018; Fürst & Grin, 2021) have pointed out the benefits of multilingualism, both socially (i.e., diversity, more business opportunities, job chances in retail, tourism, healthcare, social services and other businesses) and individually (i.e., critical thinking, open mind, less stress and less mental health problems).
- In addition, the outcomes of our study may be of interest to non-Chinese immigrant groups as well as to refugees in Canada. A summary of the outcomes will be sent to the Ministry of Education, LINK and Open Door Societies, as well as to the community heritage language schools in Saskatchewan.

In sum, heritage language theory is enriched by establishing the age threshold of a transition from a mother tongue to a heritage language, as well as by highlighting the role of the home language input and environment over the social factors. Besides, bi/multilingualism theory benefits from a broad description of connections between multiple factors in language use and language proficiency parameters. This study confirms that family language policies are highly significant and directly connected with heritage language acquisition, whereas community language schools attendance is associated for most part only with literacy, but not with proficiency parameters.

5.4.5 Limitations

Because of a small sample size (due to a relatively small population) and multiple research parameters, this study was not experimental or even quasi-experimental but largely descriptive and exploratory in nature. Due to this nature of the study, it employs only basic statistical analysis to investigate covariance between all the possible contributing factors in heritage language acquisition

that we could account for. Once these relationships are established, more detailed statistical analysis could become possible in future research. Besides, it is possible that some of the language use and exposure parameters were inter-correlated, which can be clarified in future research.

5.5 Conclusion

Though the prospect of reversing the tide of language shift is difficult, our study confirms that bilingualism is still possible among second-generation Chinese immigrants in Canada. It is apparent in our study that both parents and children highly value their Mandarin heritage language and devote significant efforts to maintain the language. These value and effort do not prevent the majority language from becoming second-generation immigrants' dominant language if Mandarin heritage language is not supported by the greater community. We can still expect a steep decline in the use of Mandarin once children begin their formal education in the majority language (Li, 2012; Xie, 2014; Zuo et al., 2021). It is a generally acknowledged fact that the linguistic standardization is realized through formal education and literacy, and the fact that bi/multilingual children lack a formal education in their heritage language explains their linguistic divergence from their monolingual peers (Montrul, 2016; Kupisch & Rothman, 2018; Polinsky, 2018). A series of studies examining Chinese heritage speakers (Wang, 1996; Xiao, 2006; He, 2010, 2015; Jia, 2017; Du, 2017; Kan, 2019; Duff & Doherty, 2019) have indicated that, for the most part, neither early-life exposure to Mandarin, no matter how involved, nor attending heritage schools can adequately maintain Mandarin as a heritage language, especially with regards to vulnerable linguistic aspects such as lexicon, morphological awareness, and complex syntax.

So, what can help the maintenance and development of the heritage language in majority environments with reduced external input? At a minimum, our study clearly shows that parents, heritage community, and mainstream society need to get involved in creating an effective and consistent environment for children to understand the importance of heritage language learning and maintenance. Exposure to formal literacy leads to higher quality and variety of input, which is normally unavailable to heritage speakers in their homes (Pearson, 2007; Unsworth, 2016), and bi/multilingual children simply cannot attain the same skills with their heritage language as their monolingual peers do with their majority language since heritage language and literacy education, on a formal, systematic and consistent basis, is not accessible for all heritage speakers in the

Saskatchewan province of Canada (Makarova et al., 2019). Thus, without authorities recognising the unique demands of Chinese heritage speakers as part of the formal educational system, children from Chinese immigrant families will grow up in a social and academic milieu in which English is considered as the only path to academic and socioeconomic success; and without doubt, they will gradually lose interest in and dedication to learning and maintaining Mandarin Chinese as their heritage language.

To maintain Mandarin Chinese as a vibrant and resourceful linguistic heritage in Canada, the efforts of immigrant parents and communities need to be coordinately acknowledged and consistently promoted in order to increase heritage language input both informally and formally. To facilitate the accessibility of Chinese heritage language education to the broader Canadian population, the authorities could leverage successful and effective heritage language teaching approaches implemented from other countries to better serve Chinese heritage language schools and other heritage language communities in Canada, and at least, to facilitate Mandarin Chinese heritage language leaning and maintenance within the province of Saskatchewan.

In short, our study demonstrates the complexity of heritage speakers' circumstances. The extension of use and input as well as attitudes to heritage language acquisition may hopefully help understand language development and individual learning differences among Chinese heritage speakers (i.e., accounting for the variabilities in the acquisition of grammatical structures), which may lead to improved heritage language pedagogical effectiveness. Parents' heritage language use and input at home and outside as well as heritage language education are playing, and will continue to play, the most vital role in heritage language acquisition, maintenance, and development.

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APPENDIX A

RECRUITMENT FLYER

UNIVERSITY OF SASKATCHEWAN

INTERDISCIPLINARY STUDIES PROGRAM

Mandarin Chinese Language Maintenance Among 2nd Generation

Immigrant Children from Chinese Immigrant Families in Saskatchewan

萨省中国第二代移民的中文保持

*Do you have **child who was born in Canada or immigrated to Canada by age of three?** Do they speak Mandarin or they used to?*

您是否有小孩是**在加拿大出生或者三岁左右移民加拿大**？他（她）们现在是否会说中文或者他（她）们曾经会说中文？

We sincerely invite you and your child who was **born in Canada or immigrated to Canada by age of 3 and currently age is from 5 to 7 or age from 10 to 12** to participate in our study! Help us to study the retention of Mandarin Chinese as a heritage language in Saskatchewan! Your participation will be very much appreciated!

我们诚挚地邀请（**在加拿大出生或 3 岁左右移民加拿大）目前 5 至 7 岁或 10 至 12 岁**的小孩及其家长参加，我们非常期待并真诚地感谢您的参与！

If you are interested in participating or have any questions, please feel free to contact *Qin Xiang* via email to qin.xiang@usask.ca.

如果您及您的小孩有兴趣参加或有任何疑问，请随时电邮至 qin.xiang@usask.ca.

Ethics approval for this study by University of Saskatchewan: BEH # 13-20

欢迎您的参与！

APPENDIX B

PARENT CONSENT FORM

CONSENT FORM

Researcher: Qin Xiang, Interdisciplinary Linguistics Program, Department of Religion and Culture, University of Saskatchewan, e-mail: qin.xiang@mail.usask.ca.

You are invited to participate in a research project entitled "*Mandarin language maintenance among children from Chinese-speaking immigrant families in Saskatchewan*". Please read this form carefully, and feel free to ask questions you might have.

This is a study of Mandarin Chinese language spoken by elementary schoolchildren and youths in Saskatchewan. I am also investigating socio-cultural factors (such as the use of Mandarin Chinese language within families, within and outside the Chinese community, etc.) related to the maintenance of Mandarin Chinese language in families. The study will help me to understand the conditions of proficiency in Mandarin Chinese language among Saskatchewan children and youths.

You will be asked to complete a questionnaire about your use of Mandarin Chinese language at home and in other settings. Your child will be asked to answer some questions, and to tell a story in Mandarin. The speech will be recorded. Please feel free to ask any questions regarding the procedures and goals of the study or your role.

The data will be collected anonymously and confidentially. Neither your name nor your child's name will appear in any form in research materials and publications. All the research materials including the records and questionnaires will be stored at the University of Saskatchewan and not released to any individuals or organizations. Data will be stored by the research supervisor for a minimum of 5 years after the completion of the study.

The data collected will be reported in research papers and academic presentations, mostly in aggregate form. Direct quotations from your questionnaire or your child's recording may be published or used in teaching materials for academic courses (on campus or long-distance internet), but no personally identifying information will ever be released.

Completion of the questionnaire and the recording of your child constitute consent to participate and permission for the researcher to use the gathered data in the manner described above. If at any later point you decide to discontinue your participation in the study, you can contact the researcher and your and/or your child's data will be deleted from the study and destroyed at your request. Your right to withdraw data from the study will apply until the data has been pooled. After this it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

Your participation in the project is purely voluntary. If you have any questions concerning this study, please do not hesitate to ask. You may also contact the researcher (at the address above) if you have questions at a later date or if you would like to find out about the results of the study.

This research project was reviewed and approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board. Any questions regarding your rights as a participant, please feel free to call the Research Ethics Office collect at 306-966-2084 or email ethics.office@usask.ca.

If you agree to participate in this study and allow your child's participation in this study, please sign below. If you would like to find out about the results of research, please check the box below. Thank you very much for your time and cooperation.

☐ I would like to have a copy of research results, and please email: _____ or
mail (a postal address): _____

I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the research project described. A copy of this consent form has been given to me for my records.

_____ _____
Printed Name of Participant Signature of Participant

_____ _____
Signature of Researcher Date

APPENDIX C

CHID ASSENT FORM

CHILD ASSENT FORM

Dear friend,

You are invited to take part in a research project. In a research project, people study something new and exciting. I study how children in Canada speak Mandarin, and request you to help me, if you are willing to do so. This is not a part of your regular class work. This is an optional activity.

If you agree, I will ask you to answer a few questions, and show you some pictures and ask you to talk in Mandarin about what you see in the pictures. I will record what you say. It will probably take you about 10 to 30 minutes to do this.

If you get tired, or bored, or you think that this is not interesting, you can stop at any time. If you stop, this will not cause anyone to be upset or angry and will not result in any type of penalty.

We will not share your story with anybody.

If you later change your mind, and you do not want me to listen to your story, you can tell me, and I will then erase the recording. You can also contact me if you have any questions.

Qin Xiang.

I study at the University of Saskatchewan.

My e-mail is qin.xiang@mail.usask.ca.

If you read this explanation or listen to it, if you understand it and agree to take part in the study, please write your printed name on the line which says 'Your Name'.

_____ _____

Your Name Signature of Participating Child

_____ _____

Signature of Researcher Date

APPENDIX D

QUESTIONNAIRE FOR PARENTS IN ENGLISH

QUESTIONNAIRE FOR PARENTS

I Family Demographic Background

1. Age group: 18-29_ 30-39_ 40-49_ 50-59_ 60-69_
2. Gender: female_ male_
3. Education level: Elementary school_ Middle school_ High school_ Secondary school_ College_ Bachelor_ Master_ PhD_ Post-doctor_
4. Currently occupational status: employed_ self-employed_ unemployed_ stay at home (i.e. housewife) _
5. Birthplace in China: _____ (city) _____ (province)
6. Have you lived in other city beside birthplace (≥6 months) in China? Yes_ No_
   If 'yes', please specify: _____ (city) _____ (province)
7. Please identify the year of immigration to Canada is _ and the age of immigration is _ years old
8. Have you lived in other city beside Saskatoon (≥6 months) in Canada? Yes_ No_
   If 'yes', please specify: _____ (city) _____ (province)
9. Have you been back to China since you immigrated to Canada? Yes_ No_ If 'yes', please specify _ year(s) per time back to China and the reason is (multiple-choice): visiting_ travelling_ working_
10 You identify yourself as: Chinese_ Canadian_ Chinese Canadian_ Canadian Chinese_

About your child 11. Your relationship with child interviewed: mother_ father_

12. Your child's age group: 5-7_ 10-12_
    12a. Your child's gender: girl_ boy_
13. Was your child born in Canada? Yes_ No_ if 'yes', his/her birthplace is_____ (city) _____ (province)
    If 'no', his/her birthplace in China is _____ (city) _____ (province)
    and he/she immigrated to Canada in _ (year) and by_ years old
14. Has your child lived in other city beside Saskatoon (≥6 months) in Canada? Yes_ No_
    If 'yes', please specify: _____ (city) _____ (province)
15. Has your child been back to China? Yes_ No_ If 'yes', please specify _ year(s) per time back to China and the reason is (multiple-choice): visiting_ travelling_ learning Mandarin_

II Family Language Background

16. Was Mandarin the sole home language in your childhood (≤12 years old)? Yes_ No_
    If 'no', your home language is _____ and language level is: Native_ Advanced_ Intermediate_ Beginner_
17. Estimate your proficiency in Mandarin: (good - generally handles language well with occasional inaccuracies; moderate - coping with overall meaning in most situations with some mistakes; poor - limited competence with familiar situations only).

Mandarin proficiency in:	Native-like	Good	Moderate	Poor	Not at all
Mandarin listening					
Mandarin speaking					
Mandarin reading					
Chinese writing					

17a. Estimate your proficiency in English:

English proficiency in:	Native-like	Good	Moderate	Poor	Not at all
English listening					
English speaking					
English reading					
English writing					

About your child 18. Estimate your child's proficiency in Mandarin:

Mandarin proficiency in:	Native-like	Good	Moderate	Poor	Not at all
Mandarin listening					
Mandarin speaking					

Mandarin reading					
Chinese writing					

18a. Estimate your child's proficiency in English:

English proficiency in:	Native-like	Good	Moderate	Poor	Not at all
English listening					
English speaking					
English reading					
English writing					

About your spouse 19. Do you have spouse (or partner) residing with you and your child? Yes_ No_ If 'yes',

19a. His/her first language is Mandarin_ English_ Both Mandarin and English_ other language (specify) _

19b. Estimate his/her proficiency in Mandarin:

Mandarin proficiency in:	Native-like	Good	Moderate	Poor	Not at all
Mandarin listening					
Mandarin speaking					
Mandarin reading					
Chinese writing					

19c. Estimate you're his/her proficiency in English:

English proficiency in:	Native-like	Good	Moderate	Poor	Not at all
English listening					
English speaking					
English reading					
English writing					

About other family member 20. Is other family members (except you and/or your spouse) currently living with your child at home? Yes_ No_ If 'yes', the relationship to your child is_

20a. His/her first language is Mandarin_ English_ Both Mandarin and English_ other language (specify) _

20b. Estimate his/her proficiency in Mandarin:

Mandarin proficiency in:	Native-like	Good	Moderate	Poor	Not at all
Mandarin listening					
Mandarin speaking					
Mandarin reading					
Chinese writing					

20c. Estimate his/her proficiency in English:

English proficiency in:	Native-like	Good	Moderate	Poor	Not at all
English listening					
English speaking					
English reading					
English writing					

III Language Use at and outside the Home and the Family

21. How often do you stay with your child at home? Almost always_ Often_ Sometimes_ Seldom_ Never_

22. What language(s) do you usually speak to your child at home?

Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

22a. What language(s) do you usually speak to your child outside home?

Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

23. How often does your child answer in Mandarin when you speak Mandarin to him/her?

Almost always_ Often_ Sometimes_ Seldom_ Never_

23a. How much do you understand when your child speak Mandarin to you? All_ Most_ Half_ Few_ None_

About your spouse 24. What language(s) do you and your spouse usually speak to each other?

Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

25. What language(s) does he/she usually speak to your child at home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _
25a. What language(s) does he/she usually speak to your child outside home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

About other family member 26. What language(s) do you and this family member usually speak to each other?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

27. What language(s) does he/she usually speak to your child at home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _
27a. What language(s) does he/she usually speak to your child outside home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

About grandparents 28. Has your child met his/her grandparent(s) if they live separately? Yes_ No_ If 'yes',
a. how often do they meet? Almost always_ Often_ Sometimes_ Seldom_ Never_
b. what language(s) do grandparents usually speak to your child?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

About your child's sibling 29. Does your child have siblings? Yes_ No_ If 'yes',
a. what language(s) do your children usually speak to each other at home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _
b. what language(s) do your children usually speak to each other outside home?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

About friend/relative 30. How many Mandarin-speaking friends do you have? All_ Most_ Half_ Few_ None_
30a. How often do you speak Mandarin with your friends who speak Mandarin?
Almost always_ Often_ Sometimes_ Seldom_ Never_

31. Do you have Mandarin-speaking relatives in China? Yes_ No_ If 'yes', how often do you speak Mandarin when you call or have facetime with them? Almost always_ Often_ Sometimes_ Seldom_ Never_

About Chinese community 32. Do you go to Chinese church? Yes_ No_
If 'yes', what language(s) do you usually speak there?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

33. Do you go to other Chinese venues such as Chinese restaurants and/or stores? Yes_ No_
If 'yes', what language(s) do you usually speak there?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

34. Do you participate in Mandarin-speaking activities? Yes_ No_ If 'yes',
a. what kind of activities do you usually participate? (Multiple-choice)
Chinese New Year Celebration_ Chinese Folk Festival_ Chinese concert_ Chinese gym_
Chinese singing club_ Chinese dancing club_ Chinese martial arts club_
b. what language(s) do you usually speak there?
Only Mandarin_ Mostly Mandarin_ Both equally_ Mostly English_ Only English_ N/A (others specify) _

IV Children's Language Exposure at and outside the Home

Children's Language Exposure at and outside the home	Almost always	Often	Some-Times	Seldom	Never
35. How often does your child watch Mandarin TV?					
36. How often does your child watch Mandarin movies?					
37. How often does your child watch Mandarin animations?					
38. How often does your child listen to Mandarin songs?					
39. How often does your child listen to Mandarin radio?					
40. How often does your child browse Chinese websites?					
41. How often does your child play Chinese computer games?					
42. How often does your child call in Mandarin?					
43. How often do you teach your child Mandarin listening?					
44. How often do you teach your child Mandarin speaking?					

45. How often do you teach your child Mandarin reading?					
46. How often do you teach your child Chinese writing?					
47. How often do you read Chinese story books with your child?					
48. How often do you read Chinese textbooks with your child?					
49. How often do you teach your child Chinese poems?					
50. How often do you hold Chinese cultural activities with your child?					
51. How often do you play Chinese games with your child?					
52. How often do you celebrate Chinese traditional festivals with your child?					
53. How often do you encourage your child to call Chinese relatives in Mandarin?					
54. How often do you assist your child's Mandarin language assignments?					
55. How often do you encourage your child to speak Mandarin?					
56. How often do you praise your child in Mandarin?					
57. How often do you discipline your child in Mandarin?					
58. How often do you instruct your child in Mandarin?					
59. How often does your child attend Chinese church?					
60. How often does your child visit Chinese restaurants/stores?					
61. How often does your child participate in the activities held by Chinese community?					

Children's Exposure at Chinese Heritage Language Schools

62. Has your child attended any Mandarin language class? Yes_ No_ If 'yes',
    a. the name of Mandarin language institute:_____
    b. what kinds of Mandarin language class does your child attend?
    Mandarin language class_ Chinese literature class (i.e. poems, idioms, proverbs, etc.)_
    Mandarin cultural class (i.e. calligraphy, sing, dance, martial arts, paper-cutting, lion dance, etc.)_
    c. the highest level of Mandarin language class that your child has reached: preschool_ elementary school_ and the level is1_ 2_ 3_ 4_ 5_ 6_ 7_ 8_ 9_ middle school_ and the level is 1_ 2_ 3_ 4_
    d. the highest level of Mandarin language level that your child has achieved: primary_ secondary_ advanced_
    e. how long has your child attended Mandarin language class? Over one year (specify_ years) One year_ Over one and a half year_ One and a half year_ Under one and a half year_
    f. how often does your child attend Mandarin language class? Every weekend_ One to two days per week_ Half a day per week_ Few hours per week_ Less than two hours per week_
    g. how satisfied are you with your child's Mandarin learning progress in language class? Very satisfied_ Satisfied_ Neutral_ Dissatisfied_ Very dissatisfied_

V Parent's Language Attitudes

Parents' attitudes to children's Chinese culture maintenance	Very important	Important	Neutral	Low importance	Not important at all
63. My child identifies himself/herself as Chinese.					
64. My child identifies himself/herself as Chinese Canadian.					
65. My child follows Chinese traditional culture.					

66. My child retains Chinese traditional etiquette and custom.					
67. My child celebrates Chinese traditional festivals.					
68. My child uses a Chinese name.					
69. My child attends Mandarin Chinese language schools.					
70. My child makes Mandarin-speaking friends.					
71. My child gets married to a Mandarin-speaking spouse.					
72. My child can speak Mandarin and English and becomes a bilingual.					
Parents' attitudes to children's Mandarin language maintenance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
73. An ability to speak Mandarin will benefit my child's life and future career.					
74. An ability to speak Mandarin will assist my child in Canada by making it easier to get involved in Chinese community and Chinese cultural activities.					
75. An ability to speak Mandarin is essential for my child to keep close relationships with relatives residing in China.					
76. An ability to speak Mandarin is important for my child to maintain communication with family members and relatives who can only speak Mandarin.					
77. An ability to speak Mandarin and English will contribute to my child's cognitive development and help him/her to become smarter.					
78. An ability to speak Mandarin and English every day is easy for my child.					
79. I feel more comfortable when my child speaks Mandarin to me.					
80. I feel embarrassed if my child cannot speak Mandarin.					
81. An ability to speak English is more important than speaking Mandarin for my child in Canada.					
82. An ability to speak Mandarin is useless for my child in Canada.					

VI Language Practices

83. Please list the methods that you usually teach your child Mandarin at and outside home?
84. Please list other methods that could improve your child to speak Mandarin?
85. Please list the methods that Saskatchewan government and/or the Education department and institute could improve the possibility of maintaining Mandarin in the province?

APPENDIX E

QUESTIONNAIRE FOR PARENTS IN CHINESE

父母的问卷调查

请在适合您的信息中注明"√"，或填写：

【您的背景】1.您的年龄组：__18-29 岁 __30-39 岁 __40-49 岁 __50-59 岁 __60-69 岁

2.您的性别：__男 __女

3.您的教育背景：__小学 __初中 __高中 __中专 __大专 __成人教育 __本科 __硕士 __博士 __博士后 __

4.您的职业是：_____ 或 ____自雇 或 ____暂无业

5.您在中国的出生地是：_____（省）_____（市）

6.您是否有在中国的其他城市（除了出生地）居住超过六个月？__有 __没有，如果有，您曾居住过的地方是：_____（省）_____（市）

7.您是哪一年移居加拿大？_____年，当时您的年龄是：_____岁

8.您是否有在加拿大（除了萨斯卡通）其他的城市居住超过六个月？__有__没有，如果有，您曾居住过的地方是：_____（省）_____（市）

9.您移居加拿大后是否有回过中国？__有 __没有 如果有，a.您多久回次中国？平均____年回次中国

b.您回中国的原因是（多选）：__探亲 __旅游 __留学 __工作

10.请在以下选项中选出适合您的表述： __中国人 __加拿大人 __中国籍的加拿大人 __加拿大籍的中国人

【您孩子的背景】11.您和被采访孩子的关系是：__父子/女 __母子/女

12.您孩子的年龄组：__5-7 岁 __10-12 岁

13.您孩子是否出生在加拿大？__是 __不是 如果是，请问他/她在加拿大的出生地是：_____（省）_____（市）

如果不是，a.他/她在中国的出生地是：_____（省）_____（市）

b.他/她是哪一年移居加拿大？_____年，当时他/她的年龄是：_____岁

14.您孩子是否有在加拿大（除了萨斯卡通）其他的城市居住超过六个月？__有 __没有，如果有他/她曾居住过的地方是：_____（省）_____（市）

15.您孩子是否有去过中国？__有 __没有 如果有，a.他/她多久去次中国？平均____年去次中国

b.他/她去中国的原因是（多选）：__探亲 __旅游 __留学 __学中文

【家庭成员的语言背景】

16.在您童年时期（＜＝12 岁），普通话是否是您家里唯一使用的语言？__是 __不是 如果不是，请注明您所掌握的这种语言（除普通话外）是：_____并达到的水平是：__非常标准（接近当地人） __高水准 __中等水准 __初学者

17.请评估您**普通话**的熟练程度（**注明：很好：偶尔有误差，但大部分掌握得很好；一般：掌握大部分情况下的使用方法， 但有时候会犯点错；很差：只掌握部分熟悉的情况**）：

普通话的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
我**听**普通话听得：					
我**说**普通话说得：					
我**读**中文读得：					
我**写**中文写得：					

17a.请评估您**英语**的熟悉程度：

英语的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
我**听**英语听得：					
我**说**英语说得：					
我**读**英文读得：					
我**写**英文写得：					

[孩子]18.请评估孩子**普通话**的熟练程度：

普通话的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**普通话听得：					
他/她**说**普通话说得：					
他/她**读**中文读得：					
他/她**写**中文写得：					

18a.请评估孩子**英语**的熟悉程度：

英语的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**英语听得：					
他/她**说**英语说得：					
他/她**读**英文读得：					
他/她**写**英文写得：					

[配偶] 19.是否有配偶跟您和孩子一起居住？__有 __没有 **如果有，请作答；如果没有，请跳过有关配偶部分：**

19a.您配偶的第一语言是:__普通话 __英语 __普通话和英语 __其他语言（请注明___）

19b.请评估您配偶**普通话**的熟练程度：

普通话的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**普通话听得：					
他/她**说**普通话说得：					
他/她**读**中文读得：					
他/她**写**中文写得：					

19c.请评估您配偶**英语**的熟悉程度：

英语的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**英语听得：					
他/她**说**英语说得：					
他/她**读**英文读得：					
他/她**写**英文写得：					

[其他家庭成员] 20.**目前**是否有（除了您配偶外）其他家庭成员跟您和孩子一起居住？__有 __没有

如果有，您和他/她的关系是：_____并请作答；如果没有，请跳过有关其他家庭成员的部分：

20a.这位家庭成员的第一语言是：__普通话 __英语 __其他语言（请注明_____）

20b.请评估这位家庭成员**普通话**的熟练程度：

普通话的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**普通话听得：					
他/她**说**普通话说得：					
他/她**读**中文读得：					
他/她**写**中文写得：					

20c.请评估这位家庭成员**英语**的熟悉程度：

英语的熟练程度：	非常好（接近当地人）	很好	一般	很差	一点都不会
他/她**听**英语听得：					
他/她**说**英语说得：					
他/她**读**英文读得：					
他/她**写**英文写得：					

【语言使用】

21.您跟孩子在家的频率是： __总是 __经常 __偶尔 __很少 __几乎不

22.您**在家**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

22a.您**在外**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

23.当您跟孩子说普通话时，他/她用普通话回答您的频率是：__总是 __经常 __偶尔 __很少 __几乎不

23a.当孩子跟您说普通话时，您能听懂多少？__全部 __大部分 __一半 __少部分 __没有

[配偶] 24.您配偶跟您之间经常用哪种语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

25.您配偶**在家**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

25a.您配偶**在外**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

[其他家庭成员] 26.这位家庭成员跟您之间经常用哪种语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

27.这位家庭成员**在家**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

27a.这位家庭成员**在外**经常用哪种语言跟孩子说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

[祖父母]28.如果孩子跟他/她的外公外婆/爷爷奶奶分开居住，孩子是否有见过他/她们？__有 __没有

如果有，a.孩子跟他/她们多久见次面？__总是 __经常 __偶尔 __很少 __几乎不

b.他/她们跟孩子经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

[孩子的兄妹] 29.孩子是否有兄弟姐妹？__有 __没有 如果有，a.孩子跟他/她的兄弟姐妹**在家**经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

b.孩子跟他/她的兄弟姐妹**在外**经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

[朋友/亲戚] 30.在您的朋友圈里，您有多少朋友的第一语言是普通话？__全部 __大部分 __一半 __少部分 __没有

30a.跟说普通话的朋友交流时，您说普通话的频率是：__总是 __经常 __偶尔 __很少 __几乎不

31.您在中国是否有说普通话的朋友和/或亲人？__有 __没有

如果有，您用普通话给他/她们打电话或视频的频率是：__总是 __经常 __偶尔 __很少 __几乎不

[社区] 32.您是否有参加中国教会？__有 __没有 如果有，您在中国教会经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

33.您是否去其他说普通话的地方，比如中国餐厅/中国超市？__有 __没有 如果有，您在这些地方经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

34.你是否有参加任何使用普通话的活动？__有 __没有 如果有，

a.您经常参加使用普通话的活动有哪些？（多选）：_庆中国新年 _中国文化节 _音乐会 _体育馆 _唱歌 _跳舞 _武术

b.您在活动中经常用什么语言说话？

_只用普通话 _大部分用普通话 _普通话和英语用得一样多 _大部分用英语 _只用英语 _其他语言（请注明_____）

【孩子的语言环境】(请在以下符合的表述中注明"√")

语言环境	总是	经常	偶尔	很少	从不
35.您孩子在家看普通话的电视频道的频率是：					
36.您孩子在家看普通话的电影的频率是：					
37.您孩子在家看普通话的卡通动画的频率是：					
38.您孩子在家听普通话的音乐的频率是：					
39.您孩子在家听普通话的电台广播的频率是：					
40.您孩子在家浏览中文网站的频率是：					
41.您孩子在家玩普通话版的电脑游戏的频率是：					
42.您孩子在家用普通话打电话的频率是：					
43.您在家教孩子中文听力的频率是：					
44.您在家教孩子说中文的频率是：					
45.您在家教孩子读中文的频率是：					
46.您在家教孩子写中文的频率是：					
47.您在家和孩子用普通话讲中文故事的频率是：					
48.您在家和孩子用普通话读中文课本的频率是：					
49.您在家给孩子讲中国文学知识（比如：诗歌）的频率是：					
50.您在家跟孩子练习中国文化活动（比如：剪纸）的频率是：					
51.您在家跟孩子玩中文游戏（比如：猜词）的频率是：					
52.您在家跟孩子庆祝中国传统节日（比如：包饺子庆新年）的频率是：					
53.您在家辅导孩子的中文作业的频率是：					
54.您在家鼓励小孩给中国亲戚用普通话打电话的频率是：					
55.您鼓励孩子说普通话的频率是：					

56.您用普通话赞扬孩子的频率是：					
57.您用普通话教育孩子（比如：行为规范）的频率是：					
58.您用普通话指导孩子（比如：装玩具）的频率是：					
59.您带孩子参加中国教会的频率是：					
60.您带孩子去中国餐厅、中国超市的频率是：					
61.您带孩子去参加中文相关的活动（比如：新年晚会、文化周）的频率是：					

[中文学校] 62.孩子是否有上过中文课？__有 __没有 **如果有，请作答；如果没有，请跳过该部分：**

a.他/她在哪上的中文课？_____

b.他/她上过哪些类型的中文课程？__中文课 __文化课 __文学课 ___其他（请注明_____）

c.他/她中文课达到的最高水平为：__学前班水平 __小学水平，其年级为：__1 __2 __3 __4 __5 __6 __7 __8 __9

__初中水平，其年级为：__1 __2 __3 __4

d.他/她目前中文的语言等级为：__初级 __中级 __高级

e.您孩子的中文课上了多久？__少于一年半 __一年半 __多于一年半 __一年 __多于一年（请注明_____年）

f.他/她多久上次中文课？__每周末 __一周一/两天 __一周半天 __一周几个小时 __一周少于两小时

g.针对他/她在学校学习中文的表现和成绩，您的满意度是：__非常满意 __满意 __中立 __不满意 __很不满意

【父母的语言态度】(请在以下符合的表述中注明"√")

您认为以下语言态度的表述：	**非常重要**	**重要**	**中立**	**不重要**	**非常不重要**
63.孩子认为自己是中国人。					
64.孩子认为自己是中国籍的加拿大人。					
65.孩子遵循中国的传统文化。					
66.孩子保留中国的传统习俗。					
67.孩子庆祝中国的传统节日。					
68.孩子使用中文名。					
69.孩子上中文学校和中文课。					
70.孩子结交会说普通话的朋友。					
71.孩子将来娶/嫁一位会说普通话的配偶。					
72.孩子同时学习说普通话和英文从而具备双语能力。					
您认为以下语言态度的表述：	**非常认同**	**认同**	**中立**	**不认同**	**非常不认同**
73.学会说普通话有益于孩子将来的生活和事业。					
74.学会说普通话有益于孩子在加拿大参与到中国人的社区生活和中国文化的活动。					
75.学会说普通话对孩子跟国内的亲人保持联系是必不可少的。					
76.学会说普通话对孩子跟只会说中文的亲人保持沟通至关重要。					
77.同时学习说普通话和英文有助于孩子智力的发展，变得更聪明。					
78.孩子每天同时说普通话和英文是没有困难的。					
79.当孩子跟我说普通话时，我会感觉更舒适。					
80.如果我的孩子不会说普通话，我会感到很尴尬。					
81.孩子在加拿大生活，学会说英文比学会说普通话更重要。					
82.孩子在加拿大学会说普通话是没有用的。					

【语言实践】

83. 请列举您在家教孩子说普通话时最常采用的方法，比如：用普通话讲故事、看普通话类型的电视节目和电影、用普通话读中文的书籍和其他纸质材料（比如：报纸、杂志、广告等）、听普通话类型的歌曲或者广播等。除在家以外，您在外最常采用哪些方法教孩子说普通话？

84. 您认为还有哪些其他的方法或途径可以提高孩子说普通话？

85. 您认为萨斯喀彻温省的政府或者教育部门或者教育机构应该采取哪些措施，从而可以提高普通话在萨省的保留？

APPENDIX F

INTERVIEW FOR CHILDREN IN ENGLISH

INTERVIEW FOR CHILDREN

Language Background

1. Can you speak English? Yes_ No_
2. Can you speak Mandarin? Yes_ No_
3. Can you speak other Chinese dialect(s)? Yes_ No_ If 'yes' please specify_
4. Can you speak other language(s) other than Chinese and English? Yes_ No_ If 'yes' please specify_
5. What language do you speak better? Mandarin_ English_ Both equally_ N/A (others specify_)
6. You identify yourself as: Chinese_ Canadian_ Both equally_ Chinese Canadian_ Canadian Chinese_

Language Use and Exposure within the Family and Home

7. What language(s) do you usually use at home?
   Mandarin_ English_ Both equally_ N/A (others specify_)
8. What language(s) do you usually speak when you play with yourself?
   Mandarin_ English_ Both equally_ N/A (others specify_)
9. How often do you use Mandarin at home? Always_ Often_ Sometimes_ Few_ None_
10. How often do you use Mandarin outside home? Always_ Often_ Sometimes_ Few_ None_

Mother 11. What language(s) do you usually speak to your mother at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

11a. What language(s) does your mother usually speak to you at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

11b. How much could you understand when your mother speaks Mandarin to you?
All_ Most_ Half_ Few_ None_

Father 12. What language(s) do you usually speak to your father at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

12a. What language(s) does your father usually speak to you at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

12b. How much could you understand when your father speaks Mandarin to you?
All_ Most_ Half_ Few_ None_

Sibling 13. Do you have sibling(s)? Yes_ No_ If 'yes',

a. what language(s) do you usually speak to your sibling(s) at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

b. what language(s) do your sibling(s) usually speak to you at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

c. how much could you understand when your sibling(s) speak Mandarin to you?
All_ Most_ Half_ Few_ None_

Other family member 14. Is anyone else residing with you and your parents? Yes_ No_
If 'yes', the relationship is: _

a. what language(s) do you usually speak to him/her at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

b. what language(s) does he/she usually speak to you at home?
Mandarin_ English_ Both equally_ N/A (others specify_)

c. how much could you understand when he/she speaks Mandarin to you?
All_ Most_ Half_ Few_ None_

15. Who do you usually stay with at home? Mother_ Father_ Siblings_ Grandparents _

Media exposure at home 14. Do you watch Mandarin TV channels? Yes_ No_

16. Do you watch Mandarin movies? Yes_ No_
17. Do you watch Mandarin animations? Yes_ No_
18. Do you listen to Mandarin songs? Yes_ No_
19. Do you listen to Mandarin radio channels? Yes_ No_

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20. Do you browse Chinese websites on the Internet? Yes_ No_
21. Do you play Mandarin-speaking computer game? Yes_ No_
22. Do you call people in Mandarin? Yes_ No_

Language practices at home

23. How many hours do you usually spend speaking in Mandarin every day?
One day_ More than half a day_ Half a day_ Less than half a day_
One/two hours per day_ Less than one hour per day_ Never_
24. How many hours do you usually spend reading in Mandarin every day?
One day_ More than half a day_ Half a day_ Less than half a day_
One/two hours per day_ Less than one hour per day_ Never_
25. How many hours do you usually spend writing in Chinese every day?
One day_ More than half a day_ Half a day_ Less than half a day_
One/two hours per day_ Less than one hour per day_ Never_
26. How many hours do you usually spend listening in Mandarin every day?
One day_ More than half a day_ Half a day_ Less than half a day_
One/two hours per day_ Less than one hour per day_ Never_

Language and culture practices at home 27. Do you read Chinese story/fairytale books? Yes_ No_
28. Do you read Chinese textbooks? Yes_ No_
29. Do you learn Chinese poem? Yes_ No_
30. Do you learn Chinese idiom? Yes_ No_
31. Do you learn Chinese proverb? Yes_ No_
32. Do you recognize characters (on the material provided)? Yes_ No_
If 'yes', a. Can you read the Chinese text/小小的船 with PinYin? Yes_ No_
b. Can you read the Chinese text/雪孩子 without PinYin? Yes_ No
33. Can you write Chinese? Yes_ No_ If 'yes', please write down the characters you can think of for now:
number of characters written_ number of different characters written_ number of correct characters written_
34. Do you participate in Chinese cultural activities at home? Yes_ No_ If 'yes', please list.
35. Do you play Chinese games at home? Yes_ No_ If 'yes', please specify.
36. Do you celebrate Chinese festivals at home? Yes_ No_ If 'yes', what do you usually do?
37. Do you write Mandarin language assignments at home? Yes_ No_
38. Do you have Mandarin-speaking relatives in China? Yes_ No_
If 'yes', do you call/have FaceTime with him/her? Yes_ No_
If 'yes', a. what language(s) do you usually speak to him/her?
Mandarin_ English_ both equally_ N/A (other languages or Chinese dialects) _
b. how much could you understand when your relative speaks Mandarin to you?
All_ Most_ Half_ Few_ None_

Language Use and Exposure outside the Family and Home

Friend 39. Do you have Mandarin-speaking friends? Yes_ No_ If 'yes',
a. how many Mandarin-speaking friends do you have? More than 20_ 10-20_ 5-10_ Less than 5_
b. how many fluent Mandarin-speaking friends do you have?
More than 20_ 10-20_ 5-10_ Less than 5_
c. how often do you meet your Mandarin-speaking friends?
Daily_ a few times a week_ once/twice a week_ once/twice a month_ once/twice a year_
d. what language(s) do you usually speak to your Mandarin-speaking friends?
Mandarin_ English_ Both equally_ N/A (others specify_)
e. how much could you understand when your friends speak Mandarin to you?
All_ Most_ Half_ Few_ None_
40. Do you have English-speaking friends? Yes_ No_ If 'yes',
a. which kinds of friends do you have the most?

Mandarin-speaking friends_ English-speaking friends_ both equally_ neither of them_

b. which kinds of friends do you regularly play with?
Mandarin-speaking friends_ English-speaking friends_ both equally_ neither of them_

c. which kinds of friends do you regularly visit?
Mandarin-speaking friends_ English-speaking friends_ both equally_ neither of them_

Heritage language school 41. Have you attended Mandarin language class? Yes_ No_
If 'yes", do you like to go to Mandarin language class? Yes_ No_ and why?
If 'no', would you like to go? Yes_ No_ and why?

42. Are you currently taking Mandarin language class? Yes_ No_ If 'yes',

a. what language(s) do you usually speak during class?
Mandarin_ English_ Both equally_ N/A (others specify_)

b. how much could you understand when teacher speaks Mandarin in class?
All_ Most_ Half_ Few_ None_

c. what language(s) do you usually speak during the breaks between classes?
Mandarin_ English_ Both equally_ N/A (others specify_)

d. how much could you understand when your classmates speak Mandarin to you during the breaks between classes? All_ Most_ Half_ Few_ None_

e. does your Mandarin language class leave homework? Yes_ No_
If 'yes', do you like to do homework? Yes_ No_ and why?

Heritage community 43. Do you attend Chinese culture-related event or activity outside home? Yes_ No_
If 'yes', a. what kinds of Chinese culture-related event or activity do you usually go to?
Chinese camp_ Chinese New Year Celebration_ Folk Festival_ others (specify) _

b. what language(s) do you usually speak there?
Mandarin_ English_ both equally_ N/A (other languages or Chinese dialects) _

44. Do you go to Chinese church? Yes_ No_ If 'yes', what language(s) do you usually speak there?
Mandarin_ English_ Both equally_ N/A (others specify_)

45. Do you go to Chinese restaurants? Yes_ No_ If 'yes', what language(s) do you usually speak there?
Mandarin_ English_ Both equally_ N/A (others specify_)

46. Do you go to Chinese markets? Yes_ No_ If 'yes', what language(s) do you usually speak there?
Mandarin_ English_ Both equally_ N/A (others specify_)

47. How much could you understand when people (from outside the home) speak Mandarin to you?
All_ Most_ Half_ Few_ None

China 48. Have you been to China? Yes_ No_ If 'yes',

a. would you like to go to China again? Yes_ No_ and why?

b. how much could you understand when people speak Mandarin to you in China?
All_ Most_ Half_ Few_ None_

c. do you have problem in understanding Mandarin? Yes_ No_
If 'yes', you have problem in Mandarin (multiple-choice) listening_ writing_ reading_ speaking_

Language Attitude

49. What language(s) do you speak more now?
Mandarin_ English_ Both equally_ N/A (others specify_)

50. What language(s) do you want to speak better?
Mandarin_ English_ Both equally_ N/A (others specify_)

51. What language(s) do you feel more fun?
Mandarin_ English_ Both equally_ N/A (others specify_)

52. What language(s) do you feel more useful?
Mandarin_ English_ Both equally_ N/A (others specify_)

53. What language(s) do you feel happier when you speak it?
Mandarin_ English_ Both equally_ N/A (others specify_)

54. What language(s) do you feel more confident when you speak it?
    Mandarin_ English_ Both equally_ N/A (others specify_)
55. What language(s) do you feel cleverer when you speak it?
    Mandarin_ English_ Both equally_ N/A (others specify_)
56. What language(s) do you feel more proud when you speak?
    Mandarin_ English_ Both equally_ N/A (others specify_)
57. What language(s) do you feel more popular when you speak it?
    Mandarin_ English_ Both equally_ N/A (others specify_)
58. When you feel happy, what language(s) do you prefer to use?
    Mandarin_ English_ Both equally_ N/A (others specify_)
59. When you feel sad, what language(s) do you prefer to use?
    Mandarin_ English_ Both equally_ N/A (others specify_)
60. What language(s) do you prefer to answer when people speak Mandarin to you?
    Mandarin_ English_ Both equally_ N/A (others specify_)
61. When you can answer in Mandarin, how do you feel about yourself?
62. When you can't answer in Mandarin, how do you feel about yourself? And what do you usually do?
    Switching to English completely_ mixing English and Chinese_ others (specify) _

Language Practice

63. Do you learn Mandarin at home? Yes_ No_ If 'yes', from whom and how do you usually learn Mandarin?
64. Do you learn Mandarin outside home and/or school? Yes_ No_ If 'yes', from whom and how do you usually learn Mandarin?
65. How do yourself want to learn Mandarin?

APPENDIX G
INTERVIEW FOR CHILDREN IN CHINESE

孩子采访

【语言背景】

1. 你会说英文吗？ 会_ 不会_
2. 你会说普通话吗？ 会_ 不会_
3. 你会说其他的中国方言吗？ 会_ 不会_ 如果会，该语言是_
4. 你会说除了中文和英文以外的其他语言吗？会_ 不会_ 如果会， 该语言是_
5. 你哪种语言说得更好？ 普通话_ 英语_ 普通话和英语说得一样好_ 其他（请说明）_
6. 你觉得以下哪种表述更能描述你自己（多选）：中国人/加拿大人/中国籍的加拿大人/加拿大籍的中国人/其他

【语言使用与环境】

【在家里】7. 你在家经常用什么语言？ 普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

8. 当你自娱自乐的时候，你经常跟自己用什么语言？
   普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_
9. 你每天在家使用中文的频率是多少？ 总是_ 经常_ 偶尔_ 很少_ 从不_
10. 你每天在外面使用中文的频率是多少？ 总是_ 经常_ 偶尔_ 很少_ 从不_

[妈妈] 11. 你跟妈妈在家经常用什么语言说话？
普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

11a. 妈妈跟你在家经常用什么语言说话？ 普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

11b. 当妈妈跟你用普通话说话的时候，你能听懂多少？ 都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

[爸爸] 12. 你跟爸爸用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

12a. 爸爸跟你在家经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

12b. 当爸爸跟你用普通话说话的时候，你能听懂多少？ 都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

[兄妹] 13. 你有兄弟姐妹吗？ 有_ 没有_ 如果有，

a. 你跟兄妹在家经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

b. 兄妹跟你在家经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

c. 当兄妹跟你用普通话说话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

[其他家庭成员] 14. 是否还有其他人跟你和你的父母一起居住？有_ 没有_ 如果有，你们的关系是_

a. 你跟她/他在家经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

b. 她/他跟你在家经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

c. 当她/他跟你用普通话说话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

15. 你在家经常和谁在一起/你在家里和谁的关系最亲密？妈妈_ 爸爸_ 兄妹_ 外公外婆/爷爷奶奶_

【媒体环境】16. 你有看普通话的电视频道吗？有_ 没有_

17. 你有看普通话的电影吗？有_ 没有_
18. 你有看普通话的卡通动画吗？有_ 没有_
19. 你有听普通话的音乐吗？有_ 没有_
20. 你有听普通话的广播频道吗？有_ 没有_
21. 你有浏览中文网站吗？有_ 没有_
22. 你有玩普通话的电脑游戏吗？有_ 没有_
23. 你有用普通话打电话吗？有_ 没有_

【语言练习】23. 你每天经常有多长时间用于说普通话？
   一整天_ 多于半天_ 半天_ 少于半天_ 一/两小时一天_ 少于一小时一天_ 从不_

24. 你每天经常有多长时间用于读中文？
   一整天_ 多于半天_ 半天_ 少于半天_ 一/两小时一天_ 少于一小时一天_ 从不_

25. 你每天经常有多长时间用于写汉字？
   一整天_ 多于半天_ 半天_ 少于半天_ 一/两小时一天_ 少于一小时一天_ 从不_

26. 你每天经常有多长时间用于练习听普通话？
   一整天_ 多于半天_ 半天_ 少于半天_ 一/两小时一天_ 少于一小时一天_ 从不_

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【语言与文化相关的活动】27. 你有读中文故事书吗？有_ 没有_

28. 你有读中文的课本吗？有_ 没有_

29. 你有学中文诗吗？有_ 没有_

30. 你有学中文成语吗？有_ 没有_

31. 你有学中文谚语吗？有_ 没有_

32. （在提供的材料中）你能否认识材料中的汉字？ 能_ 不能_

a. 是否能读含有拼音的段落（小小的船）？能_ 不能_ b. 是否能读不含拼音的段落（雪孩子）？能_ 不能_

33. 你会写中文吗？会_ 不会_ 如果会，请写出你现在能想到的汉字：一共写了_个汉字，其中有_个不同的汉字，正确的汉字有_个

34. 你有在家参与中国文化相关的活动吗？有_ 没有_ 如果有，你参与过哪些中文相关的活动？

35. 你在家有玩中文游戏吗？有_ 没有_ 如果有，你玩过哪些游戏？

36. 你在家有庆祝中国的传统节日吗？有_ 没有_ 如果有，你经常怎么庆祝这个节日？

37. 你在家写中文作业吗？有_ 没有_

38. 你有亲人会说普通话（比如居住在中国的亲戚）吗？有_ 没有_ 如果有，

a. 你有给他们打电话（或视频）吗？有_ 没有_ 如果有，

b. 你经常跟他们用什么语言？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

c. 当亲人跟你说普通话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

【在朋友圈】39. 你有说普通话的朋友吗？有_ 没有_ 如果有，

a. 你有多少说普通话的朋友？ 少于 5 个_ 5 至 10 个_ 10-20 个_ 多于 20 个_

b. 你有多少朋友能说流利/标准的普通话？少于 5 个_ 5 至 10 个_ 10-20 个_ 多于 20 个_

c. 你跟说普通话的朋友多久见面？每天_ 一周几次_ 一周一/两次_ 一月一/两次_ 一年一/两次_ 从来不_

d. 你跟说普通话的朋友经常用什么语言说话？

普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

e. 当你的朋友跟你用普通话说话时，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

40. 你有说英语的朋友吗？有_ 没有_ 如果有，

a. 哪种语言的朋友你拥有的更多？说普通话的朋友_ 说英语的朋友_ 一样多_ 都不多_

b. 哪种语言的朋友你经常一起玩耍？说普通话的朋友_ 说英语的朋友_ 一样多_ 都不多_

c. 哪种语言的朋友你经常去拜访？说普通话的朋友_ 说英语的朋友_ 一样多_ 都不多_

【在学校】41. 你曾经上过中文课吗？有_ 没有_ 如果有，你喜欢去上中文课吗？喜欢_ 不喜欢_ 为什么？

如果没有，你想去上中文课吗？想_ 不想_ 为什么？

42. 你现有上中文课吗？有_ 没有_ 如果有，

a. 在中文课上你经常用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

b. 中文老师在课上说普通话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

c. 在中文课的下课期间，你经常用什么语言说话？

普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

d. 同学在中文课下课期间说普通话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

e. 中文课有没有中文作业？有_ 没有_ 如果有，你喜欢做中文作业吗？喜欢_ 不喜欢_ 为什么？

【在社区】43. 你在外面有参加与中国文化相关的活动吗？有_ 没有_ 如果有，

a. 你经常参加什么类型的活动？ （比如：中文夏令营/冬令营、庆中国新年的活动、中国文化的展示节、其他）

b. 你经常在活动中用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

44. 你去中国教会吗？去_ 不去_ 如果去，

你经常在那用什么语言说话？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

45. 你去中餐厅吗？去_ 不去_ 如果去，

你经常在那用什么语言？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

46. 你去中国超市吗？去_ 不去_ 如果去，

你经常在那用什么语言？普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

47. 当在外面有人跟你讲普通话的时候，你能听懂多少？都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

【在中国】48. 你曾经有去过中国吗？有_ 没有_ 如果有，

a. 你想再去次中国吗？ 想_ 不想_ 为什么？

b. 当有人跟你说普通话时，你能听懂多少？ 都懂_ 大部分懂_ 一半懂_ 少部分懂_ 都不懂_

c. 当你去理解普通话的时候，你是否有困难？有_ 没有_ 如果有，你哪些困难？

或者说，你在听普通话、说普通话、写汉字、读汉字或者其他方面，有困难吗？（请说明）_

【语言态度】49. 什么语言你现在说得更多？ 普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

50. 什么语言你想说得更好？ 普通话_ 英语_ 普通话和英语一样好_ 其他语言或中国方言（请说明）_

51. 什么语言你觉得更有趣？ 普通话_ 英语_ 普通话和英语一样有趣_ 其他语言或中国方言（请说明）_

52. 什么语言你觉得更有用？ 普通话_ 英语_ 普通话和英语一样有用_ 其他语言或中国方言（请说明）_

53. 当你说什么语言的时候，你觉得更快乐？普通话_ 英语_ 普通话和英语一样快乐_其他语言或中国方言（请说明）_

54. 当你说什么语言的时候，你觉得更自信？普通话_ 英语_ 普通话和英语一样自信_其他语言或中国方言（请说明）_

55. 当你说什么语言的时候，你觉得更聪明？普通话_ 英语_ 普通话和英语一样聪明_其他语言或中国方言（请说明）_

56. 当你说什么语言的时候，你觉得更自豪？普通话_ 英语_ 普通话和英语一样自豪_其他语言或中国方言（请说明）_

57. 当你说什么语言的时候，你觉得更受欢迎？

普通话_ 英语_ 普通话和英语一样受欢迎_ 其他语言或中国方言（请说明）_

58. 当你觉得高兴的时候，你更倾向/喜欢用什么语言？

普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

59. 当你觉得难过的时候，你更倾向/喜欢用什么语言？

普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

60. 当有人跟你说普通话的时候，你更倾向/喜欢用什么语言回答？

普通话_ 英语_ 普通话和英语一样多_ 其他语言或中国方言（请说明）_

61. 当你会用普通话回答的时候，你经常对自己有什么样的感受？

62. 当你不会用普通话回答的时候，你经常对自己有什么样的感受？

62a. 当你不会用普通话回答的时候，你经常怎么做？（多选）转换成全英文_ 英文和普通话交叉回答_ 其他_

【语言实践】

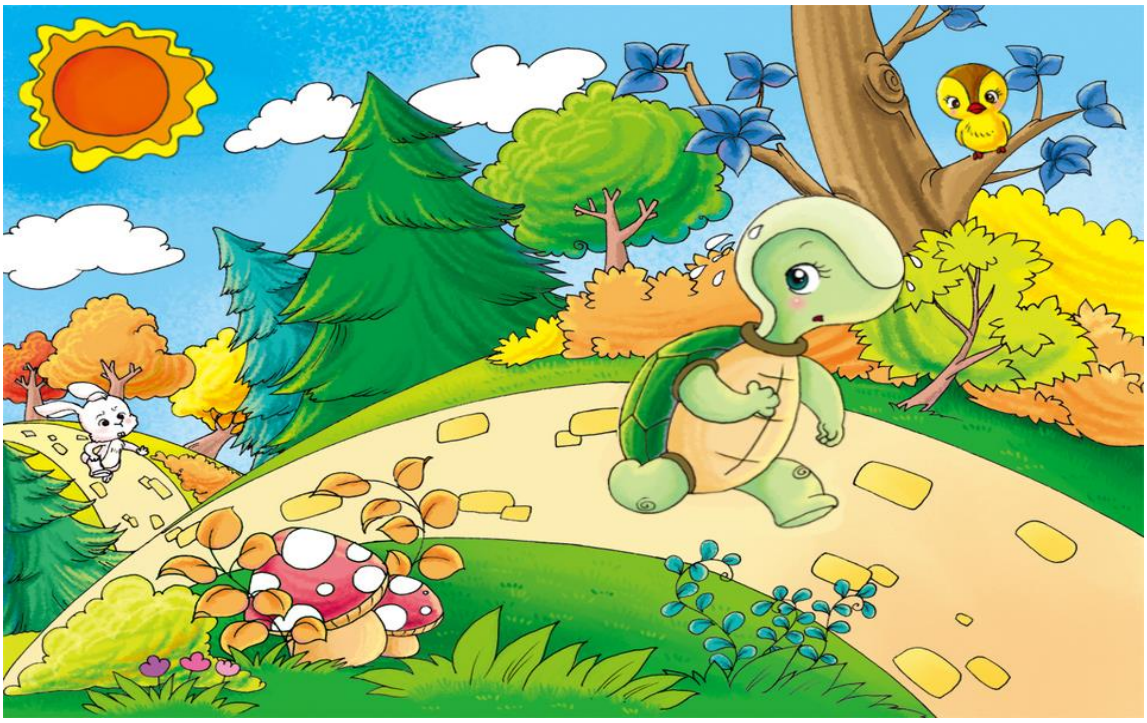
63. 你是否在家学普通话？是_ 不是_ 如果是， a. 你经常跟谁学普通话？ b. 她/他经常怎么教你学普通话？

64. 你是否在外面也学习普通话？是_ 不是_ 如果是，a. 谁经常教你学普通话？ b. 她/他经常怎么教你学普通话？

65. 你自己想如何学普通话？

APPENDIX H

THE STORY OF THE TORTOISE AND THE HARE



(Source: http://www.ibigtoy.com/books/index.php)

APPENDIX I

READING MATERIALS

tiān 天	dì 地	rén 人	wǒ 我	tā 他	yī 一	sān 三
sì 四	wǔ 五	shàng 上	xià 下	kǒu 口	ěr 耳	shǒu 手
zú 足	zhàn 站	坐	rì 日	yuè 月	shuǐ 水	shān 山
shí 石	tián 田	hé 禾	duì 对	yún 云	yǔ 雨	fēng 风
huā 花	niǎo 鸟	chóng 虫	qī 七	bā 八	jiǔ 九	shí 十
bà 爸	mā 妈	mǎ 马	土	bù 不	huà 画	dǎ 打
qí 棋	jī 鸡	zì 字	cí 词	yǔ 语	jù 句	zǐ 子

(部编版小学一年级语文上册生字表(带拼音))

7 小小的船

xiǎo xiǎo de chuán

wān wān de yuè er xiǎo xiǎo de chuán
弯 弯 的 月 儿 小 小 的 船。
xiǎo xiǎo de chuán er liǎng tóu jiān
小 小 的 船 儿 两 头 尖。
wǒ zài xiǎo xiǎo de chuán lǐ zuò
我 在 小 小 的 船 里 坐，
zhǐ kàn jiàn shǎn shǎn de xīng xing lán lán de tiān
只 看 见 闪 闪 的 星 星 蓝 蓝 的 天。

本文作者叶圣陶。

（人教版语文一年级上册第7课）

19 雪孩子

下了一天一夜的大雪。房子上、树上、地上一片白。

兔妈妈要出去找吃的。她堆了一个漂亮的雪孩子，让他和小白兔一起玩。

本文根据嵇鸿作品改写。

看着可爱的雪孩子，小白兔真高兴。他和雪孩子又唱又跳，玩得很开心。

小白兔玩累了，就回家休息。屋子里很冷，他往火里加了一些柴，就上床睡觉了。

旁边的柴火把堆着了。小白兔烧得正香，一点儿也不知道。

雪孩子从大火中救出了小白兔，自己却化了。

雪孩子看见小白兔家着火了，就飞快地跑了过去。

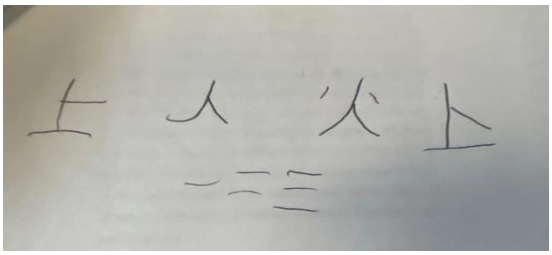
雪孩子哪里去了呢？他飞到了空中，成了一朵白云，一朵很美很美的白云。

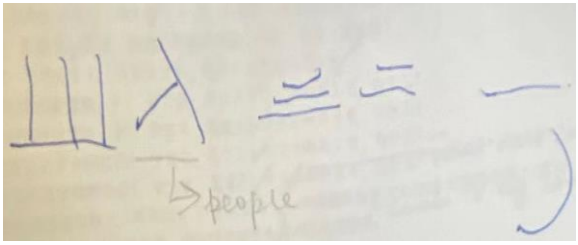
（人教版语文一年级上册第19课）

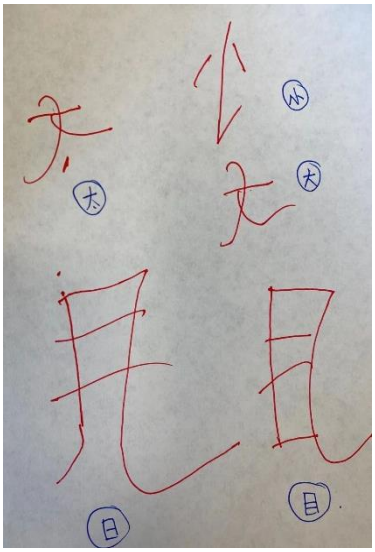
APPENDIX J

SELECTED CHILD WRITING SAMPLES

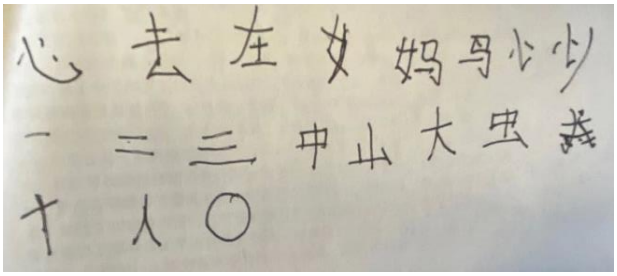
- Selected child writing samples (ages 5 to 7)

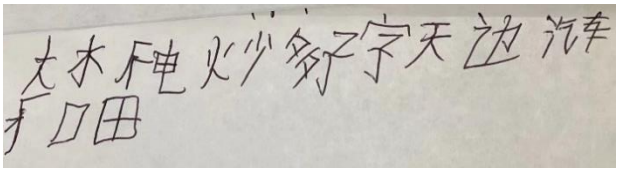


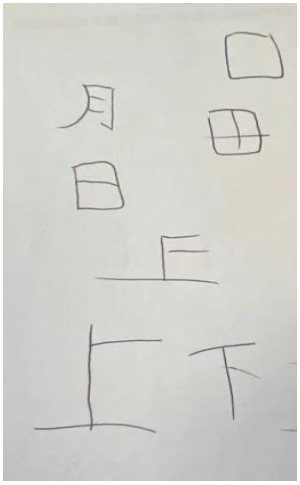




- Selected child writing samples (ages 10 to 12)





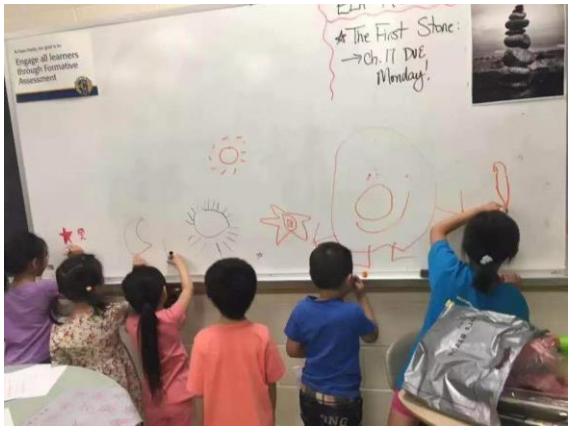


APPENDIX K

SELECTED CHILD ACTIVITY SAMPLES

- Children's performance of singing Chinese songs in Chinese New Year Gala

- Children at Chinese heritage language school



- Children's Chinese recitation contest at Chinese heritage language school

- Online resources (Chinese language learning Apps) used by children at home