(Psychological and Social) Factors Influencing the Educational Outcomes of North Korean Students in South Korean Schools

by

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Abstract

This dissertation includes two studies. The first study investigated the relationship between psychological factors related to linguistic differences and reading outcomes among North Korean students in South Korea. Specifically, the study assessed if North and South Korean children studying in South Korea differ in their reading, vocabulary, and literacy-related cognitive skills, and whether language and literacy-related skills contribute to reading outcomes among North and South Korean children in the same way. Of the total of 246 students, 123 were from North Korea and 123 from South Korea (Grade 3 to 8). The results showed that there were significant differences between the two groups in all reading tasks and in both measures of vocabulary size and South Korean vocabulary that specifically targeted lexical differences. However, there were no differences in visual processing skills, and differences in phonological awareness and rapid naming were limited to tasks that likely captured experience or education differences rather than basic cognitive processing differences. The relationships between cognitive skills, vocabulary knowledge, word and nonword reading skills, and reading comprehension varied across the two groups. Our findings suggest that it is necessary to consider linguistic characteristics when examining the variations in reading skills and vocabulary knowledge of North Korean students in South Korean schools. These findings have implications for Korean children's literacy instruction.

The second study examined how social factors affect the achievement gap between North Korean students in South Korean schools and their South Korean peers. Specifically, the study explored whether two social factors, family background and home literacy practices, are associated with the achievement gap between North and South Korean students. A total of 191 North and 154 South Korean students participated. A total of 103 North and 146 South Korean

parents also responded to the parents' home literacy practice questionnaire. The results showed that there were significant differences in academic achievement, and the largest difference was observed in English followed by social studies. Family's socioeconomic status explained the observed academic achievement differences with the exception of social studies. The two groups differed significantly in parents' home literacy practices, and the largest difference was observed in parents' reported academic interest and support with their children. The two groups also differed significantly on students' home literacy practices. The largest difference was observed in the number of academic subjects that the students studied in private tutoring (Hagwons) followed by hours per day spent in Hagwons for academic subjects during vacations. The number of digital devices available in the household was positively associated with all academic outcome measures for the North Korean students. In contrast, attending after-school learning activities (private education) was an especially important contributor to achievement among South Korean students.

These results suggest that socioeconomic status contributes to the achievement gap between the North and South Korean students. The North Korean students' demographic characteristics are particularly important in addressing their academic underachievement. In considering the challenges facing North Korean students in South Korean schools, it is essential to explore the associations between their academic achievement and home literacy environment as a part of the overall environment that influences academic achievement. These findings have implications for teacher education and the role of North Korean parents in supporting their children's education.

Preface

This dissertation is an original work by Jeongsuk Jang. The research project, of which this dissertation is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name, " Factors influencing the Academic Achievement of North Korean Students in South Korean Schools," No. Pro00062059, February 17, 2016.

I was the lead investigator and responsible for the areas of literature review, concept formation, data collection as well as manuscript composition. Dr. Rauno Parrila was the dissertation supervisor and involved in concept formation, manuscript composition, and editing. Dr. Tomohiro Inoue assisted with data analysis for Study 1 and contributed to manuscript composition and editing.

Dedication

This humble work is dedicated to North Korean mothers risking their lives to escape,
some of whom live in hiding in China and get caught and repatriated,
and some of whom make it out to safety in South Korea

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CHAPTER 1

INTRODUCTION

Famine killed hundreds of thousands of North Koreans in the 1990s and compelled a large number of others to leave in search of food and economic opportunities, and to escape from North Korea (hereafter NK) (United States Government Accountability Office, 2010). In recent years, this migration has continued. Between 1994 and 2012, at least 300,000 North Koreans sought refuge in other countries, but the actual number is likely higher (Life Funds for North Korean Refugees, 2013). Some North Koreans who have escaped from NK wish to seek resettlement in other countries, such as the United States (US) and South Korea (hereafter SK), where they may be eligible for resettlement assistance and services (US Government Accountability Office, 2010). According to data from the South Korean Ministry of Unification (MOU) (2018a), the total number of defectors to SK from 1998 through 2017 was more than 31,000. The number of North Korean children and youth (aged between six and 19) who arrived between 1998 and 2017 exceeded 3,100 (Ministry of Unification, 2018b). Of this group, 2,538 were attending elementary, middle, and high schools, and 564 were in alternative schools (e.g., Wooridul School and Heavenly Dream School).[1]

In 1997, to find a more lasting humanitarian solution for the North Korean defectors, the South Korean government passed the Protection and Resettlement Support for the Residents Who Escaped from North Korea Act. Under the Act, the government offers resettlement

[1] Alternative schools serve three groups of children and youth: those who could not succeed in mainstream education and dropped out of school, those who are young immigrants with special needs for support and adaptive education, and those who freely choose to attend the school because of its pedagogy, curriculum, or the purpose of education, which are different from those of mainstream schools. As of 2012, 210 North Korean students (aged between eight and 24) were in alternative schools (Korean Educational Development Institute, 2015).

benefits to North Koreans. These benefits provide assistance for immediate needs, such as cash and medical assistance, social and employment services, and educational services and programs (US Government Accountability Office, 2010). For example, the Ministry of Unification manages the resettlement program for North Korean children and adolescents at the Hanawon Social Adaptation Education facility. Hanawon provides special education services, such as educational programs in Korean history and democracy, psychological counseling, and health check-ups (Cho & Kim, 2011), to support North Korean students in SK for the first three months.

Despite the services in place, annual reports and studies of North Koreans in SK prepared for the US and South Korean governments have reported that North Korean students face language difficulties and gaps in studies caused by major disruptions in their lives (e.g., Han, Kang, Kim, Lee, & Kim, 2013; Ministry of Education, Science, and Technology, 2013; O, 2011; US Government Accountability Office, 2010). Chung, Chung, and Lee (2006) reported an academic achievement gap between students from NK and SK. Students from NK scored significantly lower on measures of Korean language and mathematics; at the elementary and middle school levels, respectively, they performed on average only 58.6 and 68.3 percent as well as South Korean students in language, and only 84 and 89.1 percent as well as South Korean students in mathematics on a Grade 3 standardized test (researchers often use such a test for both elementary and middle school students because, when North Korean students arrive in SK, their performance of basic academic skills in reading and mathematics is poor). Moreover, North Korean students were more likely to leave school without graduating. School drop-out rates were 3.5 percent, 12.9 percent, and 28.1 percent at the elementary, middle, and high school levels, respectively (Han, Yoon, Lee, & Kim, 2009). By contrast, average dropout rates among

South Korean students between 1999 and 2003 were 1.1−1.9%, 1.1−1.7%, and 4.0−5.1% at the middle, general high school, and vocational high school levels (Kim, 2004). The causes of these discrepancies remain unclear as they have not yet been fully studied. This dissertation will seek to address a gap in the literature by examining possible psychological and social causes of the poor educational outcomes of North Korean students in SK.

Background

As Margesson, Chanlett-Avery, and Bruno (2007) observed, a number of North Koreans have sought refuge in different countries such as China and SK, due to extremely unstable economic conditions caused by the devastating flood and great famine of 1994 and energy shortages in the late 1990s. Most North Koreans prefer to take shelter in SK. The North Korean regime's deadly punishments for defectors are well known, but the number of defectors arriving in SK has continued to accelerate since the flood and famine in 1994. Until the early 1990s, defectors arriving in SK were very few in number, typically five to ten per year (Chang, Haggard, & Noland, 2008). However, state failure to address the economic issues in NK caused mass defections, which have continued to grow since 1999. According to the South Korean MOU (2018a), the number of North Korean defectors resettled in SK totaled more than 31,000 at the end of 2017.

The border between NK and SK is not easy to cross because of the strong military presence so defectors usually leave NK for China, which has a porous border, before they continue to SK (Glosserman & Snyder, 2002). Sometimes they settle in China before moving on to SK, and sometimes they remain in China permanently. More than 300,000 North Korean defectors in China are not able to move on to SK (Margesson, Chanlett-Avery, & Bruno, 2007). Most defectors arriving to China are classified as illegal immigrants or criminals rather than

refugees. These North Koreans typically live in China for years in constant fear of being discovered by the authorities. This lack of legal and political protection for the defectors eventually forces them into grave danger, because the government of China attempts to return them to NK, where they may be imprisoned or face death.

One of the noticeable features in the past decade is that the population of North Korean defectors has completely changed not only in size but also in social structure: the social class of defectors has changed from the social elite to the working class. In earlier decades, a majority of defectors came from the North Korean elite because only members of the most successful or powerful group of people had the opportunity to leave NK. They were educated people with impressive careers and adapted easily to South Korean society. They had special knowledge about the North Korean regime and were able to give South Korea an insider's view of North Korean bureaucracy and military, which was always in great demand. Not surprisingly, they were welcomed as heroes in the South because of the valuable intelligence they brought with them. Generous benefits were available for those who reached the South. All defectors were immediately given the full rights of a South Korean citizen. Since the South Korean government has always maintained that it has legal standing as the sole legitimate authority for all Korea, all North Koreans by definition are South Korean citizens. Under the 1978 law, every defector was eligible for a generous aid package. Apart from this allowance, defectors who delivered especially valuable intelligence or equipment were given additional rewards, which could be very large. Even without these special rewards, the payments received by an ordinary defector were sufficient to ensure a comfortable life. Everyone who wished to study was granted the right to enter a university of his or her choice, not a small privilege in SK's highly competitive higher education system.

In contrast to the earlier defectors, the current defectors have been more likely to experience low social and economic status or conditions. The demographics and social composition of the defectors are very similar to those in the larger North Korean population. According to the South Korean MOU (2018c), out of 30,308 defectors, 11,562, or 38 percent, were classified as "workers." A further 14,414, or 48 percent, were described as "unemployed," largely homemakers. Only two percent are classified as "professionals," two percent as "managers" (including party cadres) and one percent as "sportsmen, artists, and entertainers." The current North Korean defectors are, in general, economic, social, and cultural minorities who are typically from impoverished rural areas (US Committee for Human Rights in North Korea, 2006).

The number of female defectors is increasing at an alarming rate. As of 2017 (April), women composed 71 percent of all defectors, and many brought their children to the South (MOU, 2018c). As a consequence, children and youth have become part of a growing number of defectors. Many left the North at an early age for a new life when the famine affected the country or their parents could not feed them. In 2017, the total number of defector children and youth in the zero to 19 age range was 4,778, and their proportion of the total defector population was 16 percent (MOU, 2018c).

Shifting demographics suggest that defectors will face new challenges, as will be described later, to integrate into South Korean culture. Many defectors have already found it difficult to integrate into that country. In particular, defector children have been struggling with education in South Korean schools.

South Korean Government Support to Defectors

Upon arrival in SK, defectors spend a month living at a government facility that has

been designed to investigate their background thoroughly and whether they are indeed defectors (O, 2011). They are shortly thereafter transferred to Hanawon, a resettlement education center in SK's countryside, and live there for three months. The goal of Hanawon is to provide social adjustment education, on-site medical and dental care, and professional counseling for defectors who need special help to prepare for a new life in the South. According to Haggard and Noland (2007), approximately half of the teaching hours are dedicated to the study of South Korean culture; the remainder is occupied by more practical training (e.g., the basics of computer literacy, driving skills, and cooking).

After three months, the defectors receive additional financial support from the state under the 1997 Act on the Protection and Resettlement Support for the Residents Who Escaped from North Korea. As noted earlier, North Korean defectors were welcomed into the South for the first few decades (prior to 1990). Being a defector was a guarantee of job security, a good income (e.g., large lump-sum payments), in-kind benefits (e.g., apartments) and access to education. This generosity placed little strain on the South Korean government's budget because only a small group of people was eligible for full state benefits. However, in the late 1980s, as the communist systems were collapsing and the Cold War ending, defectors were greatly affected by the historical facts. In 1993 and 1997, the South Korean laws governing defectors were revised and required a radical reduction in benefits available to North Korean defectors. Although the size of the defector population keeps increasing (MOU, 2018a), the defectors have little significance politically, socially, and economically to SK.

Despite the changes to immigration policies and defector benefits, the South Korean government continues to provide special classes to support defector children and youth. Educational institutions are mandated to assist them to adjust in the early stages of arrival in SK.

They receive education about re-socialization for three months at Hanawon. Children aged six to seven are educated in kindergarten classes with appropriate and trained kindergarten teachers. Primary school age children receive education for 12 weeks in a specially designated class at Samjuk Elementary School, near Hanawon, where they learn basic academic skills. Secondary students receive re-socialization education at Hankyoreh Middle and High School. It is up to the students at the Hankyoreh School as to whether they want to stay there for three months or more (the students may stay up to two years). Such programs at Hanawon for North Korean defectors last only three months (most defectors find their own homes with the government subsidy upon completion of the three-month training curriculum at Hanawon) due to program funding issues. The resocialization education provided to students from NK is not entirely satisfactory. Within the allocated time it is impossible to fully equip them with the academic skills that will help them to succeed in school. For that reason, the South Korean press and even government agencies that provide the program often criticize the educational services.

Over the last decade, the government has expressed hope that their higher education services might bridge the academic chasm between North and South Korean students, offering a full-fledged affirmative action program, which gives college-aged North Koreans the chance to bypass the grueling entrance exams to enter top South Korean universities. However, even that stopgap solution appears to be failing as large numbers of North Koreans are dropping out, creating new worries that they and other defectors could become part of a permanent underclass (Sung & Go, 2014).

After graduation from the special schools (Samjuk Elementary School and Hankyoreh Middle and High School), the younger defectors are assigned to attend nearby schools to begin their formal education (MOU, 2018c). At the same time, the students receive additional tutoring

from the teacher at the new school or participate in educational programs provided by child welfare organizations (e.g., regional community Children's center) (MOU, 2018c). Individual instruction based on the defector student's academic level is provided at local welfare institutes and the various educational programs operated by private organizations (MOU, 2018c). Most are run as after-school classes with individual instruction and counseling provided by social welfare workers. The Ministry of Education, Science and Technology along with local society and welfare organizations supports these activities to help students from NK (MOU, 2018c).

Challenges to Integration into South Korea

Government education and integration efforts have had limited success in part because of a failure to understand and address all dimensions of the challenges facing young defectors. These young people face language difficulties and gaps in their studies caused by major disruptions inherent in adjusting to a new life in the South. As defectors increasingly include children and the youth who escaped from NK without their parents (as of 2013 the cumulative number of without-parent young defectors was more than 600) (Lee & Kim, 2015), the number of serious academic challenges has increased (e.g., Ban, 2018; Kim, Kang, Kim, et al., 2016; Ministry of Education, 2017). According to the Ministry of Education (2017), the number of children and teenager defectors increases annually. Those ranging in age from six to 20 exceeded 3,400 as of 2016 (August), or about 12 percent of all defectors. Out of more than 3,400 young defectors, 2,517 attend schools, 1,143 in elementary schools, 1,374 in middle and high schools, and 171 in alternative schools. According to the South Korean MOU (2018b) there are nine alternative schools providing secondary education for young defector youths; only four are government-accredited.

It usually takes young defectors about three years to adapt to a new school life in the

South (Han et al., 2013). Adjusting to a new educational system makes it hard for them to catch up to their South Korean peers (e.g., Sung & Go, 2014). The academic gap between North and South Korean students has continued to widen (e.g., Kim & Lee, 2013; Min, 2008). In 2014, North Korean students' test scores in core academic subjects were notably lower than their South Korean peers. For example, more than 80% of North Korean students at the junior high school level (grades 7-9) performed less than 60 percent as well in math when compared with their South Korean counterparts (Kwon, 2014). According to Kwon, only 49.3% of North Korean students at the junior and senior high school levels (grades 7-12 and around ages 14-19) went to mainstream schools in SK due to poor academic achievement.

Deficiency in academic achievement among North Korean students at the junior and senior high school level causes them to drop out of school or to move or to transfer from formal to alternative education. In 2012, the dropout rate for high-school-aged defectors was 4.8 percent, down 24.1 percent from 2008. The rate for middle-school dropouts was 3.8 percent, down 9.1 percent, and the rate for elementary students was 2.6 percent, down 0.9 percent (Han, Kang, Kim, et al., 2013). The population that dropped out of school is steadily decreasing in size; however, defector students still find it difficult to adjust to formal education and often move from that to alternative schools, which has not yet been properly recognized in the job market (they can't find jobs because their education is not recognized in the job market) (Ban, 2018).

Another reason why the defectors have problems with the South Korean educational system is that it is very different from the North Korean educational system. A majority of North Koreans have at most a few years of primary education that is more focused on a narrow set of their past leaders' political beliefs than on reading and math (e.g., Fackler, 2012; Kim,

2010). Since the famine caused by the devastating flood of 1994, NK's weakening state system has failed to provide necessary care and appropriate education for children (O, 2011). North Korean children receive a formal education in a very low-quality learning environment and some children do not complete the primary education cycle of four years (the North Korean school system consists of three stages: one year of kindergarten, four years of primary school, and six years of secondary school) (Sung & Go, 2014). Additionally, the heavy emphasis on Kim Jong-il and his ideology in North Korean schools provides no help to the defector students who enroll in the extremely competitive South Korean schools, which emphasize reading, math, science, and other topics more relevant to a modern society focused on global competition.

The defector students' difficulties are exacerbated by the fact that during their journey to the South they have typically missed one to three years of study and, therefore, cannot be placed in classes with their peers but have to attend classes with younger children (Jung, Jung, & Yang, 2004; Kim & Lee, 2013). Many defectors do not finish or attend schools while in China because they have to hide to avoid being captured and deported to NK. Further, some become separated from their families and wander the streets, depriving them of any chance to obtain any kind of education (Sung & Go, 2014). Even those with Chinese fathers cannot always attend school in China because China does not recognize these children as citizens of China (McPhee, 2014). As a result, many defector students in South Korean classes tend to be two to three years older than their South Korean classmates, resulting in social stigma, which compounds the negative effects of their lower levels of education (Hong, 2002). In short, defector students face huge academic challenges due to the differences between the two countries' educational systems, curricula, and content.

Language-specific differences. There are some differences that must not be overlooked

between the written and spoken systems in the North and South Korean languages. Since the division of Korea into North and South 73 years ago, linguistic differences are found not only in the lexicon, phonology, grammar, and usage, but also in orthography (Sohn, 1999). Many South Koreans had assumed that a shared language and culture would make it easier for defectors from NK to adapt to the South Korean education system. Some argue that the linguistic differences between the two Koreas are not significant, and that the languages are mutually comprehensible. However, in a 2001 survey, only 24 percent of defectors understood South Korean speech well (as cited in Haggard & Noland, 2006). More than 60% of defectors reported language problems (Kim & Chung, 1996). Consistent with this poll, a volunteer who worked with defector children said, “Initially they understand no more than 50 percent of a lesson, and the structure of tests and the content of textbooks are unusual to them" (as cited in Haggard & Noland, 2006). Thus, lessons are frustrating for the new students. Even though North Koreans have no trouble blending into South Korean society based on their appearance, their true origins are revealed every time they speak because North Koreans speak differently. Moreover, apart from differences in meaning and pronunciation, two important peculiarities of the highly globalized South Korean society tend to become obstacles for most North Koreans: the wide use of English loanwords and the occasional use of Chinese characters. Since 1945, NK has changed loanwords to their own words and eliminated from dictionaries Sino-Korean words (or *Hanja* in Korean), which consist of both words loaned from Chinese and words coined in the Korean language (Shon, 1999).

The language barrier is often the most difficult challenge (Han, Kang, Kim, et al., 2013; Min, 2008; Ministry of Education, Science, and Technology, 2013; O, 2011; US Government Accountability Office, 2010) for college-aged defectors who are accepted to top colleges in

South Korea through a special admission process, known as "preferential" admission, which is a big advantage in SK's very competitive education system. They find it difficult to compete in SK and more often than not end up dropping out of college (Jung, Jung, & Yang, 2004; Kim & Lee, 2013), due to the academic challenge caused by the language barrier, which is the number-one reason they drop out (e.g., Kwon, 2014; Lee, 2008). For example, out of 475 defectors accepted into 10 South Korean universities in Seoul, 135, or 28.4 percent, dropped out due to the language barrier (The Chosunilbo, October 5, 2010). These challenges include English expressions and unfamiliar words. The dropout rates among North Korean defectors are high compared to 4.5 percent among South Koreans (Hong, 2010). Those who drop out of college, to some extent, suffer from a lack of self confidence (Fackler, 2012; Kwon, 2014), and some become anti-government protesters blaming the government for not doing more to help (The Guardian, April 22, 2014). Notably, some defectors say that life in a new hyper-competitive capitalist learning environment is even more frustrating and confusing than the life that they left behind (Jung, Jung, & Yang, 2004; Min, 2008). The language barrier prevents most defector children and youths from eventually adjusting to a new life in SK (e.g., Kim, 2010; Kwon, 2014, Min, 2008). Accordingly, the key question to be asked is how different linguistic features in North and South Korean language impact the educational achievement of North Korean students in South Korean schools.

Statement of the Problem

The migration of North Korean defectors to SK has increased in the last two decades (Kang, Han, Kim, Lee, & Kim, 2014), to more than 31,000 in 2017 (MOU, 2018a). As women make up the majority of defectors, the number of children and youth who are brought directly from NK, or who were born in other countries, continues to increase. To create a more robust

solution to address settlement needs and promote success in school for North Korean students in South Korean schools, the South Korean government has offered educational services and programs since 2009. However, North Korean students who attend schools in SK generally tend to lag behind and often fail to catch up with their South Korean peers (Ban, 2018; Jung, Jung, & Yang, 2004; Kim & Lee, 2013; Kim et al., 2016), and the academic gap between North and South Korean students has continued to widen. This may also contribute to the explanation why students from the North have higher drop-out rates.

To date, there has been no research into the causes of these poor educational outcomes, which may be rooted in both psychological and social factors. Numerous studies of South Korean and English-speaking children, for example, have demonstrated the importance of considering linguistic characteristics when investigating the variations in children's language outcomes; these characteristics may be responsible, in part, for children's academic achievements. At the same time, research about North Korean students in SK has revealed how relationships with peers and teachers, after-school programs, and parental support influence the way in which students adjust to schools (e.g., Ban, 2018; Kim et al., 2016). However, no research has addressed the specific factors that explain the academic underachievement of North Korean students, whose educational and family backgrounds are different from those of their South Korean peers, and who speak a form of the language that is largely similar to what is spoken in SK but varies in specific aspects of lexicon, phonology, orthography, semantics, grammar, and usage.

Purpose of the Study

The current dissertation sought to address this gap by examining the link between psychological and social factors and poor educational outcomes. It includes two studies that

involved elementary (grades 3-6) and middle school (grades 7-8) students. Study 1 investigated psychological factors affecting the achievement gap in reading performance between North and South Korean students. Study 2 examined how social factors affect the academic chievement gap between the two groups of students. The factors on which the studies focused were students' linguistic and cognitive skills (psychological factors) and students' family background and home literacy practices (social factors).

Definition of Key Terms

Some terms used in this dissertation may take on different meanings when used in different contexts. The following are definitions of terms used in this dissertation. (1) *Defectors:* People who have managed to defect for political, ideological, religious, economic, or personal reasons; (2) *North Korean in SK:* People who renounced NK and maintain residency in SK; (3) *North Korean students in South Korea:* In the present study, North Korean students were defined as students who were born in North Korea or China to a North Korean mother and a North Korean father, or to a North Korean mother and a Chinese father, and attend South Korean schools; (4) *Academic achievement:* Attainment in academic subjects. In the present study, academic achievement was defined as the mean grade point average (GPA) of the final year scores for the five compulsory subjects of Korean, mathematics, English, science, and social studies and the five core marks; (5) *Linguistic differences:* Differences between North and South Korean languages, including lexicon, semantics, phonology, and orthography; (6) *Psychological factors:* In the present study, psychological factors included cognitive skills that support literacy learning in (South) Korean, (South Korean) vocabulary knowledge, and reading skills in relation to linguistic differences between NK and SK; and (7) *Social factors:* Social factors that contribute to literacy and academic achievement included family background (socioeconomic

status [SES] and demographics) and home literacy environment.

Overview of the Dissertation

Chapter 1 introduced the problem statement and background to the study, and described the specific problem addressed as well as the operational definitions of key terms. Chapter 2 presents a review of literature and relevant research associated with the problem addressed in this study. Chapter 3 describes Study 1 that examined psychological factors affecting the achievement gap between North and South Korean students. Chapter 4 contains Study 2, which investigated how social factors affect the achievement gap between the two groups of students. Chapter 5 offers a general discussion of the findings, including the limitations of the two studies, educational implications for practice, and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

The current academic underachievement of North Korean students may be associated with both psychological and social factors. Social factors, which relate to outside influences on students' academic achievement, may interact in complex ways with psychological factors related to these students' cognitive skills. However, although Korean researchers (e.g., Ban, 2018; Han et al., 2013; Kim et al., 2016) have documented the association between social factors and social outcomes in a school environment, there have been no studies on the relationship between psychological and social factors and educational outcomes among North Korean students. This review will examine each of these groups of factors.

Psychological Factors

In addressing the cognitive aspects of the academic achievement gap between North Korean and South Korean students, it is helpful first to consider the linguistic differences between the two Korean languages in order to examine how their differences affect both North Korean children's cognitive skills and their vocabulary knowledge. While numerous studies have examined key cognitive processing skills that support learning the Korean language, no study has investigated these skills in relation to linguistic differences between children from North Korea (NK) and South Korea (SK).

Linguistic Differences

The North and South Korean languages are often mistaken for the same language; indeed many people confuse the North Korean language with local dialects in SK. This is because North and South Korea share the same alphasyllabic writing system and use the Korean

alphabet. The linguistic differences between the two languages, however, are significant. This section will first provide a brief survey of the areas of major linguistic divergence, and then examine orthographic differences in more detail.

The Korean writing system (Hangul). The Korean language has an alphasyllabary writing system; in other words, it contains two characteristics that need to be considered: (a) alphabetic script and (b) syllabic script. That is, a syllable block is made up of sequences of 24 letters, and the syllable block is the basic unit of written and spoken Korean.

Korean alphabet. Hangul contains 14 simple consonant letters, including the five visually prototypic consonant letters (ㄱ, ㄴ, ㄷ, ㅅ, and ㅇ) and the nine consonant letters derived from the prototype by adding one- to three-strokes (e.g., ㅋ, ㅌ, and ㅎ). These consonant letters can be combined with each other in order to form another five doubled consonant letters (ㄲ, ㄸ, ㅆ, ㅉ, and ㅃ) and 11 complex consonant letters (e.g., ㄳ, ㄶ, and ㅈ). The 10 simple vowel letters are derived by combining three basic strokes (•, ㅡ, and ㅣ): the small dot (•), which is not used in the modern Korean alphabet, is transformed into a short vertical stroke or a short horizontal stroke when added to a long horizontal (e.g., (ㅡ) + (•) → ㅜ) or a long vertical axis (e.g., (ㅣ) + (•) → ㅏ), respectively. These 10 simple vowel letters (e.g., ㅏ and ㅣ) can also be combined with each other to form 11 compound vowel letters (e.g., ㅐ). In total, there are 51 letters in the Korean alphabet: 19 (syllable onset consonants) + 21 (syllable nuclear vowels) + 27 (syllable coda consonants) – 16 (duplicate consonants in the syllable onset and coda positions) (see Table II-1).

Table II-1

Korean Alphabet

Syllable position	Letter
Onset (C)	ㄱ ㄴ ㄷ ㄹ ㅁ ㅂ ㅅ ㅇ ㅈ ㅊ ㅋ ㅌ ㅍ ㅎ ㄲ ㅆ ㄸ ㅃ ㅉ (19)
Nuclear (V)	ㅏ ㅑ ㅓ ㅕ ㅗ ㅛ ㅜ ㅠ ㅡ ㅣ ㅐ ㅒ ㅔ ㅖ ㅘ ㅙ ㅚ ㅝ ㅞ ㅟ ㅢ (21)
Coda (C)	ㄱ ㄴ ㄷ ㄹ ㅁ ㅂ ㅅ ㅇ ㅈ ㅊ ㅋ ㅌ ㅍ ㅎ ㄲ ㅆ ㄳ ㄵ ㄶ ㅄ ㄺ ㄻ ㄼ ㄽ ㄾ ㄿ ㅀ (27)

Note. C = Consonant; V = Vowel.

Syllable blocks. Unlike those in an alphabetic writing system, Korean alphabetic characters are arranged top-to-bottom as well as left-to-right in a square structure, or a syllable block (called *Kulja* in Korean). Each syllable is represented by one block, and characters cannot stand alone. The block of syllables usually consists of three parts: initial characters (or "initials"), which are always consonants (syllable-onset); one or more medial characters (or "medials"), which are always vowels and diphthongs (syllable-nuclear); and final characters (or "finals"), which are always consonants (syllable-coda). However, a syllable may also consist of only two parts, the initial and the medial (CV, body); the final is optional.

It is important to note that a syllable block cannot consist of the medial and the final (VC, rime) or the initial and the final (CC). In other words, it is orthographically impossible for Korean readers to parse the units of VC and CC; the non-linear arrangement of letters in Korean discourages parsing the two graphemes (VC and CC) together. There are 19 initials, 21 medials, and 27 finals; mathematically, there are 11,172 (19 x 21 x 28, including one null final) possible syllable blocks. However, only 2,300 of all the possible syllable blocks are used in Korean (Kim & Kang, 1997). Some syllable blocks serve as a word by themselves, while others consist of words or functional words (e.g., morpheme) attached to a word. South Korean words are

generally composed of one to four syllables.

Letter placement within syllable blocks. In addition to observing syllabic structure, spellers have to ensure that letters are positioned properly within the block as illustrated in Figure 1. Medial vowel letters with a long vertical bar (e.g., ㅣ, ㅕ, and ㅏ) are placed to the right of the initials, while those with the long horizontal bar (e.g., ㅡ, ㅗ, and ㅜ) are placed below the initials. One or two final consonants (called *Batchim* in Korean) are always written at the bottom, under the previous set of initials and medials. If there are two finals, these should be written from left to right at the bottom, under the previous set of consonant and vowel letters. Based on the characteristics of the spatial arrangement patterns, some researchers have divided syllable blocks into nine distinct types (e.g., Kang & Lee, 1969; Lee & Kim, 1981) (see Figure II-1).

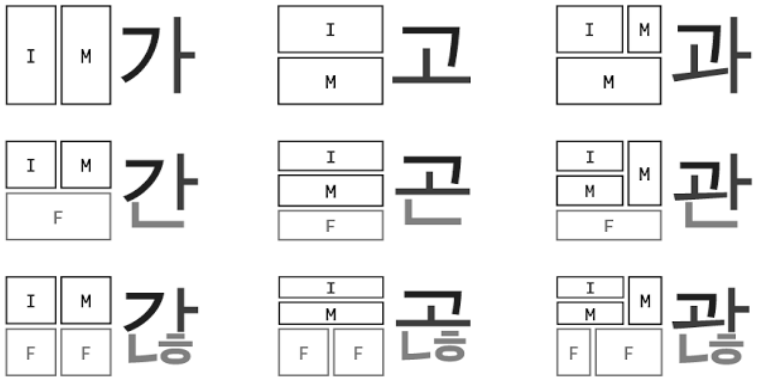

Figure II-1. The nine types of Korean syllable blocks. I=initial; M=medial; F=final. Figure adapted from the exposition at Politecnico di Torino (2010).

Syllable block types. Based on the position of the medials and the presence of the finals, there are nine possible syllable types, which can be divided into three groups: those which have no final, those which have one final, and those which have two finals (see Table II-2).

Table II-2

Syllable Block Types in Korean

Group	Type	Pattern	Example
	1	C + *h*V	가
Group 1	2	C + *v*V	고
	3	C + *v*V + *h*V	과
	4	C + *h*V + *f*C	간
Group 2	5	C + *v*V + *f*C	곤
	6	C + *v*V + *h*V + *f*C	관
	7	C + *h*V + *f*C1 + *f*C2	갆
Group 3	8	C + *v*V + *f*C1 + *f*C2	곦
	9	C + *v*V + *h*V + *f*C1 + *f*C2	괎

Note. C=consonants; *h*V=horizontal vowels; *v*V=vertical vowels; *f*C=final consonants; *f*C1=the first final consonants; *f*C2=the second final consonants.

As illustrated in Table II-2, the first group (including Types 1, 2, and 3) has no final consonant letter within a syllable block. The simplest syllables (Type 1) in this group are composed of two letters that include a single initial consonant and a horizontal medial vowel to the right of the initial in a left-to- right (LTR) pattern. An example of this form is 가: ㄱ is the initial and ㅏ is the medial, which is placed beside the initial because ㅏ is on the vertical axis and is always written horizontally to the right of the initial. More complex syllables (Type 2) are written with a vertical medial under the initial in a top-to-bottom (TTB) pattern. An example is 고: the medial vowel ㅗ is placed under the initial consonant ㄱ because ㅗ is on the horizontal axis, which is written vertically below the initial. The most complex syllables (Type 3) in this first group contain two medial vowels; in the example of 과, the first vowel ㅗ

is on the horizontal axis and is written vertically below the initial, the second vowel ㅏ is on vertical axis and is written horizontally at the right of initial, and the initial consonant letter ㄱ is in the middle, between the two.

The second group (including Types 4, 5, and 6) takes the same form as the first group; the only difference is the adding of one final consonant, which is written at the bottom under the previous set of initial consonant letters and medial vowel letters. An example of the simplest syllables (Type 4) in this group — which have a horizontal medial and a final consonant written in a clockwise direction in a right-to-bottom (RTB) pattern — is 간: ㄱ is the initial, ㅏ is the medial placed at the right, and ㄴ is the final placed at the bottom. Similarly, for more complex syllables (Type 5) that have a medial under the initial and a bottom final, 곤 is an example: ㄱ is the initial, ㅗ is the medial placed under the initial, and ㄴ is the final written at the bottom. Finally, the most complex syllables (Type 6) — which include a wrapping medial — switch direction: down (a vertical vowel), right (a horizontal vowel), and then down (a bottom consonant). For example, the syllable 관 has two medials and a bottom final: ㄱ is the initial, ㅗ is the first medial that goes under the initial, ㅏ is the second medial that goes to the right of the initial and the first medial and lastly, ㄴ is the final at the bottom.

The last group (including Types 7, 8, and 9) takes the same form as the first and second groups, except that there are two finals written left to right at the bottom. An example of the

simplest syllables (Type 7) in this group is 갆, which includes a horizontal medial to the right of the initial and two different consonant finals at the bottom: ㄱ is the initial, ㅑ is the medial to the right of the initial and lastly, ㄴ is the first final and ㅎ is the second final written at the bottom in a left-to-right pattern. An example of more complex syllables (Type 8) is 곦: ㄱ is the initial, ㅛ is the medial under the initial, and ㄴ is the first final and ㅎis the second final at the bottom. Finally, the most complex syllables (Type 9) contain two medials and two different consonants as the final. An example of those is 괆: ㄱ is the initial, ㅛ is the first medial that goes under the initial, ㅑ is the second medial that horizontally goes to right of the initial, and ㄴ is the first final and ㅎ is the second final at the bottom in a left-to-right pattern. Although these three examples of 갆, 곦, 괆 are nonwords, there are many real words for Type 7 (e.g., 맑) and Type 8 (e.g., 옳); however, real words with Type 9 syllables are rare.

Areas of major language differences. The areas of major linguistic differences between the two languages include the lexicon, semantics, phonology, and orthography (Shon, 1999). According to Shon, there are significant differences in the lexicon due to the two states' differences in language policies and their ideological and social differences. Similarly, in semantics, many expressions in NK have metaphorical connotations, intended to make people mindful of the country's socialist revolutionary struggles. For example, /lo.tong/ (NK) vs /no.tong/ (SK) "labor" has a different meaning (Shon, 1999). In NK, it means a purposive action

by means of political or physical effort that is beneficial to the society, whereas in SK it simply refers to physical work. There are also many words that differ according to phonological features. Additionally, some consonants have different names in the two Koreas (e.g., ㄱ/kɪ.ɨk/ in NK vs. /kɪ.yʌk/ in SK. In many cases, however, these differences are reflected in their orthography. These orthographic differences in turn contribute to language performance errors (Shon, 1999). For this reason, a major focus of this dissertation will be on orthographic differences.

Orthographic differences. The orthographic differences between NK and SK have resulted in certain major modifications of phonemes, syllables, and words. As a result, these modifications affect syllable blocks in terms of the two visual factors (i.e., the number of letters within syllable blocks and the spatial array of letters within syllable blocks). These factors increase the complexity level within syllable blocks. Consequently, this may lead to key language performance errors.

The first difference lies in the direction of writing (Shon, 1999). Traditionally in Korean, each syllable block within a word is written horizontally from left to right or vertically from top to bottom. For example, the word 어머니 /ʌ.mʌ.ni/[2] (mother) is composed of three syllable blocks (어/ʌ/, 머/mʌ/, and 니/ni/). Each syllable block can be written in a left-to-right order: the first syllable (어) /ʌ/ is placed on the far left within the word; the second syllable (머) /mʌ/ is then placed to the right of the first syllable, and the last syllable (니) /ni/ is placed to the right

[2] IPA phonetic transcription

of the second syllable. In the same example, the syllable blocks can also be written in a top-to-bottom order: the first syllable (어) /ʌ/ is placed at the very top within the word; the second syllable (머) /mʌ/ is then placed under the first syllable; and the last syllable (니) /ni/ is placed under the second syllable. In this respect, South Korean follows the tradition of allowing both horizontal and vertical writing, whereas North Korean uses only horizontal writing (a left-to-right pattern).

The second difference relates to the pronunciation and spelling of the word-initial ㄹ/l/ form. In SK, the Chinese word-initial ㄹ/l/ is not pronounced before the vowel /i/ or the semivowel /yʌ/ and is pronounced /n/ elsewhere. It is spelled as such (e.g., 이유 /i.yu/ [reason] and 노인 /no.in/ [the elderly]). By contrast, in NK, it is pronounced /r/ and spelled as such (e.g., 리유 /ri.yu/ [reason] and 로인 /ro.in/ [the elderly]) (Shon, 1999).

Similarly, the languages differ in their use of the word-initial ㄴ/n/ form. In SK, the Chinese word-initial ㄴ/n/ becomes silent before the vowel /i/ and the semivowel /yʌ/ and is not spelled (e.g., 여자 /yʌ.ca/ [woman] and 이르다 /i.rɨ.ta/ [to reach]). In NK, it is pronounced and spelled (e.g., 녀자 /nyʌ. ca/ [woman] and 니르다/ni.rɨ.ta/ [to reach]) (Shon, 1999). There are 24,990 words impacted by these differences (Park, 2011). Table II-3 shows some examples.

Table II-3

The Differences between North and South Korea in the Word-initial ㄹ/ㄴ Form

SK	이유	유대	예절	노동력	여학생
	/i.yu/	/yu.tɛ/	/yɛ.cʌl/	/no.toŋ.lyʌk/	/yʌ.hak.sɛŋ/
NK	리유	류대	례절	로동력	려학생
	/li.yu/	/nyu.tɛ/	/lyɛ.cʌl/	/lo.toŋ.lyʌk/	/nyʌ.hak.sɛŋ/

Fourth, spellings of loanwords – those derived from other languages – are considerably different in the two languages (Shon, 1999). NK's spellings of terms for general objects are influenced by Russian and Japanese, whereas SK's spellings reflect English pronunciations; e.g., SK's 컵 /kʌp/ (cup) and 마이너스 /ma.i.nʌ.sɨ/ (minus) correspond to NK's고뿌 /go.ppu/ and 미누스 /mi.nu.sɨ/, respectively. Additionally, in the case of loanword place names, NK's spellings follow the pronunciations used in the respective countries, whereas SK's spellings follow English convention; e.g., SK's 멕시코 /mek.si.ko/ (Mexico) corresponds to NK's 메히꼬 /me.hi.kko/, and SK's 헝가리 /hʌng.ga.ri/ (Hungary) corresponds to NK's 왱그리아 /wɛng.gɨ.li.a/.

The use of the so-called *epenthetic* ㅅ ("si ot" in Korean; /s/ at the syllable-initial position of syllables; /t/ at the syllable-final position of syllables) in compound nouns is the fifth difference (Shon, 1999). It is spelled in SK only when the preceding noun root ends in a vowel; otherwise, it is left out. For example, 내 /nɛ/ (river) and 가 /ka/ (side) are combined into냇가 /nɛt.ka/ (riverside). Note that ㅅ is added to the syllable-final position of the first syllable in the

compound noun (냇) because the syllable (내) ends in a vowel ㅐ /ɛ/. However, 길 /kil/ (road) and 가 /ka/ (side) are combined into 길가 /kil.ka/ (roadside). Note that in this case, ㅅ is not added to the first syllable because this syllable (길) ends in a consonant (ㄹ). By contrast, it is left out everywhere in NK, as in 내가 /nɛ.ka/ (riverside). There are 5,008 words impacted by this difference (Park, 2011). Table II-4 shows some examples.

Table II-4

The Differences between North and South Korea in the Epenthetic ㅅ

SK	잇몸 /it.mom/	숫자 /sut.ca/	냇가 /nɛt.ka/	나뭇잎 /na.mut.ip/	아랫방 /a.lɛt.paŋ/
NK	이몸 /i.mom/	수자 /su.ca/	내가 /nɛ.ka/	나무잎 /na.mu.ip/	아래방 /a.lɛ.paŋ/

Finally, there are abundant intermittent lexical disparities between the two languages, as illustrated below in Table II-5 (Shon, 1999) (see also Appendix A). In the two languages, the concordance rates for “everyday use” vocabulary and technical vocabulary are about 64% and 34%, respectively (Han, 2015).

Table II-5

The Differences between North and South Korea in Lexical Items

SK	지푸러기 /ji.pu.leo.ki/	쇠고기 /soe.ko.ki/	가뜩이 /ka.tteuk.i/	달걀 /dal.kyal/	퍽이나 /peok.i.na/
NK	지푸레기 /ji.pu.le.ki/	소고기 /so.ko.ki/	가뜩히 /ka.tteu.hi/	닭알 /talg.al/	퍼그나 /peo.keu.na/

In sum, the major causes of orthographic differences can be traced to six factors. These

differences result in modifications of syllables in particular, which in turn affect not only the number of letters within syllable blocks but also the structure of syllable blocks; this results in an increase in the complexity level of syllable blocks and language performance errors.

Cognitive Skills

In examining the challenges facing North Korean students, it will be necessary to link this new research investigating linguistic differences with established research into cognitive skills. This section reviews the four major cognitive skills that have been shown to relate to Korean literacy skills: visual processing, phonological awareness, rapid automatized naming, and vocabulary. A close look at research into all four skills suggests the possibility that differences between the two Korean languages may influence the literacy development of North Korean students.

Phonological awareness. Phonological awareness (PA), defined as an individual's understanding of the sound structure of words, is an important determiner in learning to read and spell in many languages. Research on PA and reading has shown that strong (or poor) readers have strong (or poor) PA skills in English and other Indo-European languages (e.g., Adams, 1990; Wagner & Torgesen, 1987; Ziegler & Goswami, 2005). These skills also contribute to spelling ability for typically developing and dyslexic children in English; this is often explained in terms of the role of PA in encoding (Bourassa & Treiman, 2003; Caravolas, Hulme, & Snowling, 2001; Ehri, 1998, 2000; Foorman, Francis, Novy, & Liberman, 1991; Stanovich, Siegel, & Gottardo, 1997; Treiman & Bourassa, 2000).

Furthermore, developing PA and learning to read and spell are often reciprocal processes; PA instruction may improve literacy skills and vice versa (Burgess & Lonigan, 1998; Bus & Van IJzendoorn, 1999; Perfetti, Beck, Bell & Hughes, 1987; Troia, 1999). In English, learning to

read and developing phonemic awareness, a subset of PA involving the ability to identify and manipulate the smallest units of sound that can differentiate meaning, are mutually reinforcing (e.g., Ehri, 1979, 1984; Ehri & Wilce, 1979; Goldstein, 1976; Perfetti, 1985). Reading in an alphabetic orthography requires phonemic knowledge: readers must understand the alphabetic principle (i.e., letters represent phonemes) in order to read a new word based on its constituent letters (Perfetti, Beck, Bell, & Hughes, 1987). On the other hand, learning some orthographic principles through reading facilitates phonemic awareness. For example, while illiterate adults lack phonemic awareness, literate adults who recently have acquired literacy show phonemic awareness (Moráis, Carey, Alegría, & Bertelson, 1979).

This relationship may be more complex and less certain in other languages. There are arguments, for example, that orthography and PA are reciprocally related, and that phonemic awareness may be less important, in Indian alphasyllabaries and Hong Kong Chinese. For students reading an Indian alphasyllabary, phonemic awareness may not play a crucial role in reading due to the orthographic nature of the scripts (Prakash, Rekha, Nigam & Karanth, 1993). Recent research has also suggested that readers with different levels of reading ability, who have not been exposed to English, performed lower on phonemic awareness tasks than readers of alphabetic scripts (e.g., Gupta, 2004; Karanth, 2002; Mishra, 2006; Nag, 2007; Nag-Arulmani, 2003; Nag & Sircar, 2008; Padakannaya, 2000; Padakannaya & Rekha, 1993; Padakannaya, Rekha, Vaid & Joshi, 2002; Patel & Sooper, 1987; Ramaa, Miles, & Lalithamma, 1993; Sailaja, 2000; Vasanta, 2004).

Similarly, phonemic awareness may be less important in reading Hong Kong Chinese. This may be because, unlike Chinese-speaking children in China and Taiwan, who are taught to read Chinese using a phonemic coding system (Pinyin) or an onset-rime system (Zhu-Yin-Fu-

Hao), children in Hong Kong use rote-learning to read Chinese characters holistically, including the characters' visual configurations and pronunciation (Chung, Ho, Chan, Tsang, & Lee, 2010; Ho, Chan, Chung, Lee, & Tsang, 2007). In addition, individuals who read Hong Kong Chinese and have been exposed to an alphabetic system when learning to read (e.g., Pinyin) show greater phonological awareness skills than those who have not (Chen, Lai, Wong, & Hills, 2001; Ho & Bryant, 1997; Huang & Hanley, 1994, 1997; McBride-Chang et al., 2005).

Curiously, however, South Korean speakers – like their English counterparts – do seem to benefit from PA in reading. Research into the PA and literacy skills of Korean children has shown that in addition to phoneme awareness, syllable awareness is positively related to word reading (Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007, 2009a) and spelling (Kim, 2009a, 2010). However, it is not clear whether this is true of North Korean students, and the differences between North and South orthography influence the development of phonological awareness in North and South Korean children in SK.

Rapid automatized naming. Research on rapid automatized naming (RAN), defined as how quickly individuals can name aloud continuously presented and highly familiar visual stimuli, such as symbols (letters and digits), colors, and objects, has provided extensive evidence for the role of RAN in reading (Compton, DeFries, & Olson, 2001; Kirby, Parrila, & Pfeiffer, 2003; Savage et al., 2005; Wolf & Bowers, 1999; Wolf & O'Brien, 2001). Serial RAN has been shown to be related to word reading for average-achieving readers and those with reading disabilities in English (for reviews, see Kirby, Georgiou, Martinussen, & Parrila, 2010; Scarborough, 1998; Wolf & Bowers, 1999).

However, there have been contradictory findings regarding whether skills in serial RAN contribute to word reading in Korean. Some studies have found that serial RAN was not related

to word reading for children in Grades K, 1, and 2 once phonological awareness and vocabulary were controlled (Cho & McBride-Chang, 2005; Kim, 2011). By contrast, other studies have found that serial RAN was related to word reading for children aged between four and five even after controlling for vocabulary, PA, visual skills, and morphological awareness (Cho et al., 2008).

A limitation of the existing studies is that naming speed has been measured using a *scalar* quantity, a measurement in which there are no directional components. Although speed is a scalar quantity, Korean reading is also associated with a directional movement, a vector quantity involving both the magnitude of speed and the direction of the movement. This is firstly because Hangul letters are written horizontally and/or vertically, and syllable blocks may be written either horizontally or vertically in a running text. Secondly, because Korean readers commonly read from left to right, they might be expected to have more difficulty with visual stimuli in which letters are arranged vertically from top to bottom than with those in which letters are arranged horizontally from left to right. Thus, naming speed in RAN-Letters tasks requiring children to name the stimuli in a left-to-right progression might differ from that in tasks asking to name stimuli in a top-down progression.[3]

Visual skills. While numerous studies have examined key cognitive processing skills, two unique visual factors (the number of letters within syllable blocks [irrespective of whether the letters are placed in the syllable-onset, -nuclear, or –coda positions] and the spatial arrangement of the letters within syllable blocks) that influence children's literacy skills in

[3] It should be noted that Protopapas, Altani, and Georgiou conducted a study (2013) using data from Greek children to examine the directions (left-to-right and downward) of visual scanning in reading, which found that there is no difference between left-to-right and downward. However, the study used digits and objects, not letters. Unlike those in an alphabetic writing system, Korean alphabetic letters are arranged top-to-bottom as well as left-to-right in a square structure, or a syllable block.

Korean have not received much attention from researchers. These factors may increase the visual complexity of syllables and can contribute to linguistic performance errors.

It is becoming increasingly apparent that visual skills affect students' comprehension. Several studies have established that the processing load of a syllable block corresponds to the number of final consonant letters within it (see Chung, 2006; Lee, 2008; Park, 2009; Yoon, 1997). For example, Lee (2008) found that children in Grades 3, 4, 5, and 6 often have more trouble reading syllables that contain a final consonant letter than those that contain no final. In addition, Chung (2006) showed that children in Grades 1, 2, and 3 have difficulty with syllables with a doubled consonant at the syllable-initial position (e.g., 빠).

Another important factor affecting visual complexity and performance errors is spatial arrangement patterns, which are based on the direction of medial vowel letters. In Korean, the direction of the longer bar of medial vowel letters can have a considerable impact on the perceptual organization of syllable blocks (Park, 2009). For example, 고 /ko/ may be more difficult to process than 가 /ka/ due to the vertical direction of the vowel letter (ㅗ). Lee (2008) found that children experienced difficulty with syllables when letters within a syllable block were arranged from top to bottom (e.g., 골/kol/, a top [the initial ㄱ/k/]-middle [the medial ㅗ /o/]-bottom [the final ㄹ/l/] pattern). However, there has been a paucity of studies examining spatial arrangement patterns. Although Chung (2006) showed that children in Grades 1, 2, and 3 experienced difficulty with syllable blocks with a compound vowel letter at syllable-medial positions (e.g., 봐 /pwa/), he concluded that this difficulty arose from the number of vowel

letters within a compound vowel; e.g., the vowel letter (ㅘ /wa/) of the syllable block 봐 /pwa/ is composed of ㅗ/o/ and ㅏ/a/ (two vowels). It is not clear whether the source of the difficulty is the number of letters within syllable blocks and/or the spatial arrangement patterns of the letters within syllable blocks.

Vocabulary Knowledge

Of the cognitive skills that may affect reading performance, the one that may be most complex in the case of Korean students, and the one closely related to linguistic differences, is vocabulary (Shon, 1999). Vocabulary is an important determiner for word reading in English (Harm & Seidenberg, 2004; Ouellette, 2006; Plaut, McClelland, Seidenberg, & Patterson, 1996). Research on vocabulary has shown that it correlates positively with phonological awareness (Bowey & Francis, 1991; Chaney, 1992; Lonigan, 2007). Its size and growth affect the development of phonological representations (Walley, Metsala, & Garlock, 2003). Furthermore, vocabulary is the main source of morphological knowledge (Carlisle, 2004). In Korean, however, the situation may be somewhat different: Kim (2011) showed with young Korean-speaking children that vocabulary is not related to word reading and spelling.

Vocabulary may become significant, however, when we account for the differences between the North and South Korean languages. The biggest difference in language use between NK and SK lies in vocabulary as a result of political differences (Ko, 1999; Lee, 1990). This is evident in the language barrier of North Koreans who have defected to SK. Such persons may not understand up to 60 percent of what South Koreans are saying, mainly because of differences in vocabulary between the two countries (Choe, 2006; Kwon, 2012). However, it is not clear how the vocabulary differences are related to word reading among North Korean

children and youth.

To sum up, linguistic differences between the two Korean languages may influence North Korean children's literacy learning in SK. No study has investigated key cognitive processing skills in Korean in relation to these differences, and as a result, it is necessary to assess the relationship between language divergence in NK and SK and educational outcomes among North Korean students in SK.

Social Factors

Social factors that contribute to literacy and academic achievement include family, the education system, and the political system (see Bourdieu, 1991). Although numerous studies have demonstrated that a child's home environment has a significant influence on school attainment academically and emotionally (e.g., Caro, McDonald & Willms, 2009; Sanders & Sheldon, 2009; Sheldon, 2009), there has been no research into the association between family background and the educational outcomes of North Korean students in SK. Furthermore, differences between South and North Korean students in SK in terms of home literacy practices may affect the achievement gap between the two groups. It is therefore important to consider these factors in more detail.

Family Background

In the second part of the study, three dimensions of family background —socioeconomic status (SES), demographics, and home literacy environment —will be examined. Each of these dimensions can influence the educational outcomes of North Korean students. However, previous research has often neglected these measures, and only a few studies have related even one of the dimensions to school adjustment.

Socioeconomic status (SES). It is important to note the important role played by

demographic shifts among North Korean defectors in the past two decades. There has been an increase in the number of both working class and female immigrants, many of whom have fewer employment skills and are less educated. The community of North Korean defectors has changed in its social structure from being composed of members of the social elite to including mostly the working class (Lankov, 2006). Most of the earlier defectors, who left NK between the end of the Korean War and 1993, came from the North Korean elite because only members of the most successful or powerful groups had the opportunity to leave. Many were educated people with impressive careers who adapted with relative ease to South Korean society.

In contrast to the earlier defectors, recent defectors have been more likely to experience lower SES. For example, out of 26,711 people who defected from NK between 1998 and 2014, 10,083, or about 38 percent, were classified as *workers*. A further 12,924, or about 50 percent, were described as *others* (largely children, youth and unemployed housewives), whereas only 2 percent were classified as *professionals* (Ministry of Unification, 2014). According to the Ministry of Unification, female defectors now make up the majority of defectors. Females comprised only 12 percent of defections to SK in 1998, but 79 percent (adult women constituting nearly 60 percent of all defectors) in 2014.

This shift in social backgrounds has led to new challenges for defectors attempting to integrate into SK. The defectors' social positions are directly linked with low income status in SK. After they arrive in the South, North Korean families are one of the main beneficiaries of the country's National Basic Livelihood Security Program. Thirty-two percent of North Korean defector households benefit from the program, while only 3.2 percent of South Korean households are recipients (Ministry of Unification, 2014). Most of the families from NK (close to 95%) earn a monthly income of less than $1,500 USD, and 66.7% earn less than $1,000 USD

(Han et al., 2009).

Demographics. Additional factors that contribute to challenges for North Korean students which are related to their demographics include their place of birth, the regions that they come from, their school ages, and family members with whom they live. Many female defectors take their children to the South or give birth in other countries such as China (Ministry of Education, Science, and Technology, 2013). According to Han et al. (2013), North Korean children born in other countries who now attend South Korean schools comprised 54.1 percent of North Korean students at the elementary school level, 43.5 percent at the middle school level, and 1.3 percent at the high school level. By contrast, the percentage of students who came directly from the North and now attend South Korean schools is 45.9 percent in elementary school, 56.5 percent in middle school, and 98.7 percent in high school.

In regard to the students who come directly from the North, they may also disproportionately come from certain regions of the country, especially those close to the Chinese border. For instance, more than 60 percent of students who participated in a longitudinal study by Han et al. (2013) were from North Hamkyeong and a further 20 percent came from Ryanggang; these are mountainous regions where the rates of *stunting* (defined by the World Health Organization [WHO] as a condition in which children fail to gain sufficient height, given their age) are significantly higher than the national average, and the rates of *wasting* (defined by the WHO as a situation in which a child has failed to achieve sufficient weight for height) reached 6.1 percent (Ryanggang) and 4.8 percent (North Hamkyeong) in 2012. This was in comparison to the national average prevalence of 4 percent (Food and Agriculture Organization of the United Nations and World Food Programme, 2013).

Furthermore, because students can miss one to three years of study during their long

journey to SK, they can be two to three years older than their South Korean classmates. Han et al. (2013) reported that students who study together with same-age peers comprised only 43.9 percent, 50.5 percent, and 56.3 percent at the elementary, Grade 7, and Grade 8 levels, respectively; this can result in lower levels of educational attainment and low graduation rates, given that the age of the student is an important consideration in learning motivation and progress (Han et al., 2013; Min, 2008; Ministry of Education, Science, and Techonology, 2013).

Han et al. (2013) additionally identified different types of families from NK based on the presence or absence of a parent: 46.2 percent of the 429 students who participated in the study lived with both parents; 42 percent with their mother, 3.5 percent with their father, and 8.3 percent without either parent. The number of North Korean children between six and 20 years old who arrived between 1998 and 2012 exceeded 3,800. Of this total, about 600 younger defectors belonged to the *without-family* category.

Home Literacy Environment

The home literacy environment (HLE) contributes to children's success or failure in reading and educational outcomes (e.g., Burgess, Hecht, & Lonigan, 2002; Sénéchal and LeFevre, 2002). Early home literacy experiences, such as parental involvement, parent-child interactions, and parental instruction, can play a crucial role in the development of literacy. Various studies have demonstrated these influences. In 1996, for example, a report prepared by the United States (US) Department of Education stated that parental involvement was a key factor influencing literacy development. Sénéchal and LeFevre (2002) additionally documented a direct relationship between early literacy environment at home and later fluent reading, and an indirect relationship between children's early experiences and later reading outcomes. In addition, Mikulecky (1996) showed the association between a child's later literacy success and

parent-child interactions, such as a parent reading books to a child and parent-child communication and language. Specifically, Burgess, Hecht, and Lonigan (2002) reported that the HLE plays an important role in the development of educational outcomes. They suggested that children benefit from home environments that provide exposure to literacy-related events.

Furthermore, Burgess et al. (2002) argued that the HLE is a complex and multi-faceted phenomenon. Curry (2012) identified five components of home literacy: reading environment, reading activities, reading beliefs, reading frequency, and SES. According to Curry, the reading environment includes reading behaviors, resources, and contexts both within and outside school and daycare; reading activities refer to reading practices in the reading environment; reading beliefs refer to parents' and children's positive attitudes toward the reading environments and activities; and SES indirectly influences the reading environments and activities (frequency).

In recent years, the HLE has also been studied with Korean-speaking populations; however, there has been no research examining the HLE of North Korean children in SK. In addition, there has been little research related to the HLE of older readers (school-age students). In one study, Kim (2009b) found a positive association between frequent home-reading and emergent and conventional literacy development. Working with Korean-speaking SK children (aged between 4 and 5) and their families, Kim confirmed the importance of frequent reading at home for vocabulary and letter-name knowledge, phonological awareness, and word and pseudo-word reading in Korean. Her findings also suggested that Korean parents were more likely to believe that the teacher has the overall responsibility for children's learning processes and literacy acquisition at an early age. This tendency limited the extent of parental involvement in explicit instruction on literacy at home. These findings have provided a good understanding of how the cultural model of Korean literacy acquisition contributes to a child's literacy abilities.

In considering the challenges facing North Korean students in South Korean schools, it is important to explore whether there are associations between their academic achievement and the HLE as a part of the overall environment that influences educational outcomes. Specifically, the effect of the HLE on the academic attainment of students over the age of six is still unclear, and more research is needed.

Chapter Summary

Little research has been conducted on the poor educational outcomes among North Korean students in SK. Specifically, social and psychological factors have yet to be examined to study their influence on academic achievement and to investigate how they affect educational outcomes. The purpose of this project is to examine some aspects of these factors in detail.

In this context, two hypotheses will be tested. The first is that social and psychological factors may explain the widening academic achievement gap between North and South Korean students. The second is that linguistic differences between North and South Korean languages may impact cognitive skills and further academic outcomes among North Korean students in SK. Family backgrounds and home literacy practices among students of the two Koreas will be investigated as social factors. At the same time, students' cognitive skills related to linguistic and orthographic differences will be examined as psychological factors.

Accordingly, the present dissertation conducted two studies into the causes of poor educational outcomes among North Korean students in SK. Study 1 investigated how language and literacy-related skills contribute to poor academic achievement among North Korean children. Study 2 examined how family background and home literacy practices affect the

achievement gap between South and North Korean students. Together, the two proposed studies will provide further insight into the academic underachievement of North Korean students in SK.

CHAPTER 3

STUDY 1: RELATIONSHIP BETWEEN LINGUISTIC DIFFERENCES AND READING PERFORMANCE

Introduction

In examining the challenges facing North Korean students studying in South Korea (SK), it will be necessary to link the current study on linguistic differences between the two Korean languages to established research on cognitive skills. While numerous studies have examined key cognitive processing skills (phonological awareness, RAN, visual skills) that support literacy learning in Korean, no study has investigated these skills in relation to the linguistic differences between the two languages for children from North Korea (NK) and SK.

The differences between the two languages are significant. There are significant variations in the lexicon due to the ideological and social differences and different language policies of the two countries. Similarly, in terms of semantics, many expressions in NK have metaphorical connotations, intended to make people mindful of the country's "socialist revolutionary struggle." There are also many words that differ in their phonological features, and these differences are reflected in their orthography (Shon, 1999). The orthographic differences in turn can contribute to reading errors (Shon, 1999).

Perhaps the most substantial difference in language use between NK and SK lies in vocabulary, and results from the political differences between the two countries (Ko, 1999; Lee, 1990). This is evident in the language barrier of North Koreans who have defected to SK. They may not understand up to 60 percent of what South Koreans are saying, mainly because of differences in vocabulary (Choe, 2006). Thus, we would expect that vocabulary differences may affect reading performance, and reading comprehension in particular, of North Korean students.

No study has examined how vocabulary differences are related to reading skills among North Korean children and youth studying in SK.

Phonological awareness (PA) is an important predictor of reading and spelling performance in many languages. Research into the PA and literacy skills of South Korean children has shown that in addition to phoneme awareness, syllable awareness is positively related to word reading (Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007, 2009a) and spelling (Kim, 2009a, 2010). However, it is not clear whether this is true of North Korean students, and whether the differences between North and South Korean orthography influence the development of phonological awareness and how it is related to reading among the North Korean students in SK.

Research on rapid automatized naming (RAN) has provided extensive evidence for the role of RAN in reading in every language (e.g., Cho & McBride-Chang, 2005; Georgiou, Parrila, & Papadopoulos 2008; Nag & Snowling, 2012; Parrila, Kirby, & McQuarrie, 2004). However, there have been contradictory findings regarding whether skills in RAN contribute to word reading in Korean. In addition, the linguistic difference in the direction of writing (Shon, 1999) – each syllable block within a word is written horizontally from left to right or vertically from top to bottom in SK, but only horizontally in NK – may affect how students perform in RAN tasks.

Additionally, two unique visual factors (the number of letters within syllable blocks and the spatial arrangement of the letters within syllable blocks) impact the visual complexity of syllables and emphasize the role of visual processing skills. However, there is a paucity of studies examining visual processing. Moreover, it is not clear whether linguistic differences in the direction of writing between NK and SK would affect the performance of the North and

South Korean students in visual processing tasks.

No existing study has investigated whether North and South Korean students studying in SK differ in the key cognitive processing skills or in how these are related to reading. Study 1 will first examine how North Korean students studying in SK perform in tasks assessing vocabulary knowledge and the three major cognitive skills – phonological awareness, rapid automatized naming (RAN), and visual processing. Second, Study 1 will examine how language and literacy-related skills contribute to reading performance among North and South Korean students in South Korean schools. As discussed in Chapter 2, a close look at research into all four skills suggests the possibility that differences between the two Korean languages may influence the literacy development of North Korean students differently than they influence the literacy development of South Korean students. The following are the specific research questions:

Research Questions

Question 1. Are there differences in three cognitive skills − phonological awareness, RAN, and visual skills − between South and North Korean students in SK?

Question 2. Are there differences in vocabulary knowledge between the two groups?

Question 3. Are there differences in reading skills − word reading, pseudo-word reading, and reading comprehension − between the two groups?

Question 4. How are cognitive skills and vocabulary knowledge related to reading performance in the two groups?

Methods

Participants

To examine all four questions, a total of 194 North and 151 South Korean students were

tested and asked to fill out a demographic questionnaire (see Appendix B.1) and all of the students responded to the questionnaire. However, we used a subsample ($N = 246$) in the analysis to match the samples in terms of grade. The same students were involved throughout the study and included 44 Grade 3, 32 Grade 4, 22 Grade 5, and 26 Grade 6 elementary school students, and 50 Grade 7 and 72 Grade 8 middle school students. Of the total of 246 participants, 123 were from NK and 123 from SK. All paticipants were from the same school classes. Their parent(s)/guardian(s) (hereafter referred to as parents) were also asked to fill out a family's socioeconomic status (SES) questionnaire (see Appendix B.2). Of the 194 North Korean students' parents surveyed, 103 (53%) responded to the SES questionnaires. Of the 151 South Korean students' parents surveyed, only 62 (41%) responded to the SES questionnaire.

Demographic characteristics. Table III-1 shows the demographic characteristics of the North and South Korean students who participated in this study.

The North Korean students (62 girls and 61 boys) included 62 elementary school students and 61 middle school students. The South Korean students (59 girls and 64 boys) included 62 elementary school students and 61 middle school students. The percentage of students aged 13 or under (in grades 3-6) and students aged 14 or above (in grades 7-8) was 47.1% vs. 51.3%, and 52.9% vs. 48.7% for NK vs. SK, respectively.

The North and South Korean students differed significantly in their living situations: 20% of North Korean students lived with their sibling(s) as opposed to 69% of the South Korean students; 39% of the North Korean students lived with one parent vs. 11% of the South Korean students; 55% of the North Korean students lived with both parents vs. 89% of the South Korean students; 11% of North Korean students lived with a guardian or relatives vs. zero percent of the South Korean students.

Table III-1

Descriptive Statistics for the North and South Korean Students' Demographic Profiles

Characteristic		NK (*n* = 123) N (%)	SK (*n* = 123) N (%)
Gender			
	Girl	62 (50.4)	59 (48.0)
	Boy	61 (49.6)	64 (52.0)
Grade			
	In grades 3-6 (Elementary school)	62 (50.4)	62 (50.4)
	In grades 7-8 (Middle school)	61 (49.6)	61 (49.6)
Age			
	Under 10	9 (7.3)	4 (3.3)
	10	13 (10.6)	20 (16.3)
	11	14 (11.4)	14 (11.4)
	12	8 (6.5)	11 (8.9)
	13	14 (11.4)	14 (11.4)
	14	22 (17.9)	26 (21.1)
	15	14 (11.4)	34 (27.6)
	16 or above	29 (23.6)	0 (0)
Living situation in SK [a]			
	Siblings	25 (20.3)	85 (69.1)
	A parent	48 (39.0)	14 (11.4)
	Parents	67 (54.5)	109 (88.6)
	Guardian	5 (4.1)	0 (0)
	Relatives	9 (7.3)	0 (0)

[a] The participants selected all that applied.

Table III-2 reports the demographic profile of the North Korean students alone. The North Korean students vary in where they were born, the length of stay in the place of birth, whether they had previous schooling, the highest level of the previous schooling, and their length of stay in SK. Of the total of 123 North Korean students, 49 (39.8%) were born in NK, where two (1.6%) had lived for less than one year, 10 (8.2%) for one to five years, 18 (14.7%) for five to nine years, and 20 (16.2%) for nine years or more before arriving in SK. Seventy-two (58.5%) were born in China, where seven (5.7%) had lived for less than one year, 11 (9.0%) for one to five years, 30 (24.4%) for five to nine years, and 26 (21.1%) for nine years or more

before arriving in SK. All of the South Korean students were born in SK.

Of the 123 North Korean students, 45 (36.6%) did not attend school before their arrival in SK, two did not remember whether they had previous schooling, and 76 (61.8%) had attended schools either before or after leaving NK. Of the 76 students with previous schooling, 24 (31.6%) attended North Korean schools, 51 (67.1%) attended Chinese schools, and one (1%) attended school in another country. Eleven students only attended kindergarten, 11 (8.9%) received some elementary school education or completed elementary school, and two (1.6%) received some middle school education or completed middle school in NK. In turn, ten (8.1%) attended kindergarten, 32 (26.1%) received some elementary school studies or completed elementary school, and 10 (8.1%) received some middle school studies or completed middle school in China. Twenty-one (17.1%) North Korean students had been living in SK for less than one year, 30 (24.4%) for one to three years, 27 (21.9%) for three to five years, and 45 (36.5%) for five years or more.

Table III-2

Descriptive Statistics for the North Korean Students' Demographic Profiles

Characteristic		N (%)
Birth Place		
	NK	49 (39.8)
	China	72 (58.5)
	Other	2 (1.6)
Length of stay [a]		
NK	Less than 1 year	2 (1.6)
	1-5 years	10 (8.2)
	5-9 years	18 (14.7)
	9 years or more	20 (16.2)
China	Less than 1 year	7 (5.7)
	1-5 years	11 (9.0)
	5-9 years	30 (24.4)
	9 years or more	26 (21.1)
Other	Less than 1 year	2 (1.6)
Previous Schooling		76 (61.8)
	NK	24 (31.6)
	China	51 (67.1)
	Other	1 (1)
Highest Grade		
NK	Only attended kindergarten	11 (8.9)
	Grade 1 - 4 (elementary school level) [b]	11 (8.9)
	Grade 5 - 6 (middle school level)	2 (1.6)
China	Only attended kindergarten	10 (8.1)
	Grade 1 - 6 (elementary school level)	32 (26.1)
	Grade 7 - 9 (middle school level)	10 (8.1)
Other	Grade 2	1 (.8)
Length of stay in SK [c]		
	Less than 1 year	21 (17.1)
	1-3 years	30 (24.4)
	3-5 years	27 (21.9)
	5 years or more	45 (36.5)

[a] The categories for the length of stay in NK, China, or other countries were: (1) less than 1 year, (2) 1-3 years, (3) 3-5 years, (4) 5-7 years, (5) 7-9 years, (6) 9-11 years, (7) 11 years or more.
[b] The North Korean school system consists of three stages: one year of kindergarten, four years of primary school, and six years of secondary school.
[c] The categories for the length of stay in SK were: (1) less than 1 year, (2) 1-2 years, (3) 2-3 years, (4) 3-4 years, (5) 4-5 years, (6) 5 years or more.

Socioeconomic background. The socioeconomic status (SES) questionnaire was divided into four parts: parents' education level, parents' occupation and position, parents' occupational status, and monthly household income. As not all parents responded to the SES questionnaire, this data was available for only a subset of the participants.

The categories for parents' education level were: (1) Some elementary school studies, (2) Completed elementary school, (3) Some middle school studies, (4) Completed middle school, (5) Some high school studies, (6) Completed high school, (7) Some community college, (8) Completed college diploma, (9) Some university studies, (10) Completed university degree, (11) Some graduate or professional studies, (12) Completed graduate or professional degree. The two groups differed significantly in the education level that their parents had received. Of the 51 fathers living with North Korean students, 22 (43.1%) had received some elementary school education or completed elementary school, six (11.8%) had completed middle school, 21 (41.2%) had attended high school or completed high school, and two (3.9) had attended university. Of the 60 fathers living with South Korean students, 14 (21.7%) had attended high school or completed high school, 12 (20.0%) had attended community college or completed college diploma, 17 (28.3%) had attended university or completed university degree, and 17 (28.3%) received some graduate or professional training or completed a graduate or professional degree.

Similarly, of the 89 mothers living with North Korean students, six (6.7%) had completed elementary school, 24 (26.9%) had attended middle school or completed middle school, 46 (51.7%) had attended high school or completed high school, 11 (12.4%) had attended community college or completed community college, and two (2.2%) had attended university. Of the 61 mothers living with South Korean students, five (8.2%) had completed middle school,

14 (22.9%) had received some high school education or completed high school, 11 (18.0%) had attended community college or completed college diploma, 17 (27.9%) had attended university or completed a university degree, and 14 (22.9%) had attended graduate or professional training or completed a graduate or professional degree.

The categories for parents' occupational position were as follows: (1) Laborer (four categories unskilled to foreman), (2) Self-employed (four categories independent or co-op farmer to independent with 10 or more employees), (3) Manager/Professional (three categories with special qualifications to in leadership position), (4) Civil servant (four categories lower level service to upper level service), and (5) Other. The categories for parents' occupational status were as follows: (1) Not working at the moment, (2) Part time or hourly work (less than 15 hours per week), (3) Part-time work (15 to 34 hours per week), (4) Full-time work, (5) On temporary leave, and (6) In training.

The sample of the North Korean fathers consisted almost exclusively of unskilled laborers (88.0%), with only 4% identified as skilled laborers, and 8% as other. The South Korean fathers' responses to the occupational position question included skilled laborer (21.7%), self-employed worker (25.0%), manager or professional in a highly specialized position (40.0%), and civil servant (13.4%). Most North Korean fathers and mothers worked part-time (62.8%), whereas most South Korean fathers worked full-time (96.6%). Half of the South Korean mothers (55.7%), as compared to 2% of the North Korean mothers, were full-time homemakers.

Finally, the categories for household income were as follows: (1) Less than $1,000, (2) $1,000-1,500, (3) $1,500-2,000, (4) $2,000-2,500, (5) $2,500-3,000, (6) $3,000-3,500, (7) $3,500-4,000, (8) $4,000-4,500, (9) $4,500-5,000, (10) $5,000-6,000, (11) $6,000-8,000, (12)

$8,000-10,000, and (13) $10,000 or more.

Twenty-seven (26.2%) North Korean families had monthly household incomes of less than $1,000, 57 (55.3%) of $1,000 to $1,500, 17 (16.5%) of $1,500 to $2,000, and two (1.9%) of $3,500 to $4,000. The South Korean families had monthly household incomes that ranged from $1,500 to $10,000 or more: 10 (16.1%) had an income of $3,000 to $3,500, eight (12.9%) had an income of $4,000 to $4,500, and seven (11.3%) had an income of $10,000 or more.

In short, many North Korean students came from lower SES families. These results are in line with those of previous studies (e.g., Chang, 2006; South Korean Ministry of Unification, 2013).

Measures

Phonological awareness. Because no instrument was available to measure phonological awareness (PA) in Korean children older than seven years of age, the researcher developed a phoneme elision task (see Appendix C.1) to adequately assess PA in the participants aged 12 to 15. In the phoneme elision task, children were asked to delete a sound in a given position in a two-syllable or three-syllable word. All the words in the phonological task were selected from English pseudo-words. For example, “Say /ɪs.pɛk/” (espek); “Now say /ɪs.pɛk/ without /p/” [ɪs. ɛk]. There were two practice items and 15 test items of increasing difficulty. Each was scored dichotomously.

In addition, the researcher developed a syllable deletion task (see Appendix C.2 for details) based on the two linguistic differences in North and South Korean languages to compare the performance of South and North Korean children. In the syllable deletion task, children were presented with a total of 20 items including both two-syllable (five items for *word-initial* ㄹ/ㄴ and five items for *epenthetic* ㅅ) and three-syllable words (five items for

word-initial ㄹ/ㄴ and five items for *epenthetic* ㅅ*),* and were asked to delete one syllable. They were not asked to delete the syllable that is different between SK and NK in spelling and pronunciation. For example, in the case of 노인 /no.in/ (the elderly) in SK (로인 /ro.in/ in NK), they were asked to delete the second syllable. Deleting /in/ from /no.in/ would produce /no/ among South Korean children, but /ro/ among North Korean children. Each item was scored dichotomously. Items were presented following South Korean pronunciation.

Rapid automatized naming. The RAN tasks (from Lee & Park, 1999) were presented with two different stimuli: five letters (ㄱ/k/, ㅅ/s/, ㅎ/h/, ㅏ/a/, and ㅗ/o/) and five numbers (2, 4, 6, 7, and 9). All students reported letter and digit names in a left-to-right progression. Each stimulus was repeated quasi-randomly five times across five rows and in five columns. As there were few errors, only completion times were recorded.

Visual skills. The students were administered the standardized Visual Spatial Relationships task and the Visual Discrimination task from Gardner's (1996) Test of Visual-Perceptual Skills (non-motor), Third Edition (TVPS-3). The task has demonstrated good internal consistency and test-retest reliability across languages (McBride-Chang, Chow, Zhong, Burgess, & Hayward, 2005). In the Visual Spatial Relationships task, the student was asked to identify which of the five alternatives, including the target and four visually confusable distracters, was in a different direction from the other forms. In the Visual Discrimination task, the student was asked to identify the alternative identical to the target (two-dimensional line-drawn figure). Both tasks consisted of one practice item and 16 test items. The items were presented in increasing order of difficulty. Administration was terminated if the student failed

four out of five consecutive items. Each item was scored dichotomously.

Vocabulary knowledge. The expressive vocabulary (hereafter Vocabulary Size) task for children between the ages of 13 and 15 from the standardized Receptive and Expressive Vocabulary Test (REVT) (Kim, Hong, & Kim, 2009) was used. The REVT was developed to assess receptive and expressive vocabulary of children and adults. Test items were developed based on South Korean vocabulary and language development literature, as well as on two pilot studies. A test-retest reliability of .86 and a split-half reliability of .94 for the REVT-expressive vocabulary test have been reported (Kim et al., 2009).

For each item, the examiner presented a picture and read a stimulus question, and children answered a specific question, or provided a synonym for a word that fit the picture. For example, children were asked to provide names of items (e.g., kite) and synonyms (e.g., another word for "happy"). To minimize the effects of lexical differences between NK and SK, basic vocabulary items with no difference across the two Korean languages were selected. There were three practice items and 100 test items (50 names and 50 synonyms of items) of increasing difficulty. Administration was terminated if the students fails four out of five consecutive items. Each was scored dichotomously to provide a total maximum score of 100.

In addition, the researcher developed an expressive vocabulary task (see Appendix C.3 for details) (hereafter SK Vocabulary) based on lexical differences. Children were presented with a total of 50 items including Korean words of Chinese (e.g., parking lot; 주차장 /cu.ʧa.caŋ/ vs. 차마당 /ʧa.ma.taŋ/, SK vs. NK, respectively) or English (e.g., dress; 드레스 /ti.le.sɨ/ vs. 나리옷 /na.li.ot/, SK vs. NK, respectively) origin and Korean native words (e.g.,

teeth; 이빨 / i.ppal / vs. 이발 / i.pal /, SK vs. NK, respectively) with different pronunciations and spelling but the same meaning. All of the words in the task were selected from the corpus of South-North Korean language comparison (A comparison of the North and South Korean standard languages; published by The Institute for Unification Education, 2012) and the Sejong Modern Korean Corpus (published by The National Institute of the Korean Language, 2006), which contains the 2.5 million most frequently used words in modern Korean writing (The Sejong Corpus contains two subparts: written and spoken. The written corpus is different from the spoken corpus which only has 115,000 types. The written corpus includes "press articles, textbooks, novels, and poems from the 20th century" [Holliday, Turnbill, & Eychenne, 2017]).

For each item, the examiner presented a picture and read a stimulus question, and children provided names of items. Follow-up prompts were provided to the North Korean children when necessary. For example, if a child said, ¨애/ɛk/¨ in NK for¨이마/ɪ.ma/¨ (forehead) in SK, the examiner asked, "Tell me what it is in South Korean."

Two points were given for each correct South Korean word. Two points were also given to North Korean children if their answers were correct in South Korean after they were given the follow-up prompt. One point was awarded if the student provided the North Korean word, but not the South Korean word. The maximum possible score on the test was 100 for 50 correct answers.

Word and pseudo-word reading. Word and pseudo-word reading skills were examined using the standardized Word/Nonword Reading Test for children between the ages 10-12 (developed by Shin, Cho, Lee, & Chungh, 2003, and published by Division of Child and Adolescent Psychiatry, Seoul National University Hospital). The measure contains 100 high

frequency real words (selected from children's Korean language textbooks published by the Korean Ministry of Education) and 100 pronounceable nonwords of increasing difficulty, each of which the child was asked to read aloud. The internal consistency reliability of .96 (using Cronbach's alpha) and concurrent validity of 0.94 with the Korean Educational Development Institute (KEDI)-Individual Basic Learning Skills Test have been reported (Shin et al., 2003).

Each original task presents 40 two-syllable words across 20 rows and also in the first two columns, 40 three-syllable words across 20 rows and also in the second two columns, and 20 four-syllable words across 20 rows and also in the last column. The students were asked to read aloud first in a top-down progression (to effectively measure increasing levels of difficulty; easy [the first two columns] to difficult [the last column]) one column at a time as many word/nonwords as possible within two minutes for real words and four minutes for nonwords for each progression. The total reading fluency score for words and non-words was the total time spent on the two progressions. In the analysis, the total score was used, not accuracy, because there were few errors in accuracy.

Further efforts were made to minimize the effects of lexical differences between North and South Korean languages. Before the word/nonword measure was used formally, it was administered to a group of eight elementary school and 10 middle school students (11 from NK and seven from SK) in Chungnam province in South Korea. The students reported that there were no vocabulary differences that would make it difficult to read. Thus, in the administration of the measure, all the original items were used. Appendices C. 4 and C. 5 present the items in the reading tasks.

Reading comprehension. Reading comprehension was assessed using an adaptation standardized cloze task. The reading comprehension task was adapted from the Woodcock-

Johnson III Passage Comprehension subtest (Woodcock, 1997) and translated into Korean. Each student was asked to read a sentence or a short passage and to provide a specific word needed in the blank to make the sentence or passage complete. There were three practice items and 30 test items. Each was scored dichotomously.

Procedure

Because the South Korean government often does not release any information about defectors, including North Korean students and their schools in SK, which are scattered across SK, we collected data in two ways. First, we asked a former director of the North Korean Youth Education Support Center at the Korea Educational Development Institute (KEDI) to contact North Korean teachers, who were working in South Korean elementary and middle schools in Seoul and Gyeonggi province (the area surrounding the capital). Both cities were the two most populous in SK with 21.8% and 30.1%, respectively, of North Korean students in 2017. Then, the North Korean teachers requested their principals' permission for data collection. Second, we asked a top-level school administrator in the Gyeonggi provincial office of Education to contact the principals of schools which had North Korean students. Next, each principal informed teachers about the data collection. If a school principal approved the data collection, then, the principals and teachers of the participating schools were asked to read the information letter and sign consent forms (see Appendices D.1 and D.2) for their participation in this research. Finally, the teachers chose euqal numbers of North and South Korean students in their classes and sent the information letter and consent forms to the parents/guardians of the selected students (see Appendix D.3).

All measures were administered by the researcher and four research assistants who were trained in the administration of the measures used in the study. The order of administration of

the measures was varied between the examiners to control for fatigue and order effects: half of the children in each group were given the assessment battery in a particular order and the other half were presented the assessments in the reverse order. The assessment battery was administered individually to each student in a quiet classroom in two sessions of roughly 45 minutes each.

Statistical Analyses

The analyses were conducted in the following steps. First, to examine the possible differences in the cognitive skills (i.e., PA, RAN, and visual processing), vocabulary (i.e., vocabulary size and SK vocabulary), and reading skills (i.e., word reading, pseudo-word reading, and reading comprehension) between the North and South Korean groups, a series of analysis of covariances (ANCOVAs) were performed. Age, family income, and parents' education were used as covariates in the analysis.

Next, to examine the concurrent relationship between the cognitive skills, vocabulary, and reading skills in each group, we performed multigroup path analysis. The estimated model is shown in Figure 1. On the basis of previous studies with South Korean children (e.g., Cho & McBride-Chang, 2005; Kim, 2015), we expected that (a) the cognitive skills and vocabulary would be associated with reading fluency and that (b) vocabulary would have a unique association with reading comprehension over and above the association with reading fluency. In order to control for the effect of age, all the variables were standardized in each grade before the path analysis. In addition, composite scores for PA, RAN, visual processing, and reading fluency were calculated by averaging the *z* scores of the measures for each construct. The only exception was vocabulary, where the two measures were not correlated sufficiently to combine them (see below).

The model parameters were estimated using full-information maximum likelihood (FIML) estimation with non-normality robust standard errors (MLR) using Mplus (Muthén & Muthén, 1998–2017). Model fits were assessed using four commonly applied descriptive goodness-of-fit indices: the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR; for interpretation, see Kline, 2015). To determine if constraining the two paths so they were equal across the groups resulted in a worse fit than the model in which the paths were allowed to be freely estimated, the Satorra-Bentler (SB) scaled chi-square difference test (Satorra & Bentler, 2001) was used. The chi-square difference tests were appropriately scaled using scaling factors provided in the output (Muthén & Muthén, 1998–2017).

Results

Preliminary Data Analysis

We first examined the distributional properties of the variables. No significant problems in the data distributions were detected based on the skewness and kurtosis values (Kline, 2015). A few outliers in some measures were detected (scores more than 3 *SD*s above/below the mean of each group) and were moved to the tails of the distributions to avoid overemphasizing their effects on the results.

Descriptive statistics. Descriptive statistics are shown in Table III-3. Means, standard deviations, and minimum and maximum values are reported separately for the two groups for all tasks. The means of those tasks, except for visual skills, indicate that the South Korean students performed significantly better than the North Korean students.

Table III-3

Descriptive Statistics for the Measures Used in the Study

	NK (N [d] = 123)				SK (N [e] = 123)				Hedges's *g* [95% CI]
Measure	*M*	*SD*	*Min*	*Max*	*M*	*SD*	*Min*	*Max*	
Age [a]	5.21	2.32	1	8	4.83	1.96	1	7	.18 [–0.07, 0.43]
Phoneme elision	9.39	2.02	5	14	9.91	1.88	6	13	–.27 [–0.52, –0.01]
Syllable deletion	10.47	2.44	6	17	13.97	2.90	8	20	–1.30 [–1.58, –1.03]
RAN-Letters	9.93	.68	8.87	11.85	9.57	.77	8.02	11.74	.49 [0.24, 0.75]
RAN-Digits	9.62	.52	8.46	11.68	9.39	.67	8.08	11.47	.38 [0.13, 0.63]
Visual spatial relationships	14.12	3.95	6	20	14.28	3.80	8	20	–.04 [–0.29, 0.21]
Visual discrimination	14.41	4.37	6	20	14.13	4.00	8	20	.07 [–0.18, 0.32]
Vocabulary size	46.45	14.40	25	76	56.34	14.33	33	74	–.69 [–0.94, –0.43]
SK vocabulary	26.50	14.36	5	53	62.58	16.60	32	98	–2.32 [–2.64, –1.99]
Word reading	2.90	.72	2	4.5	2.56	.50	2.01	4.43	.55 [0.29, 0.80]
Pseudo-word reading	5.24	.80	4.02	7.33	4.90	.67	3.3	7.11	.46 [0.21, 0.71]
Reading comprehension	9.32	2.34	3	12	11.35	2.71	6	17	–.80 [–1.06, –0.54]
Family income [b]	2.07	1.10	1	7	8.34	2.95	3	13	–2.81 [–3.16, –2.46]
Parents' education [c]	5.70	2.02	2	10	8.71	2.31	5	12	–1.38 [–1.66, –1.10]

Note. Hedges's *g* is a measure of effect size interpreted similarly to Cohen's d; CI = Confidence Interval.

[a] The categories for age were: (1) under 10, (2) 10, (3) 11, (4) 12, (5) 13, (6) 14, (7) 15, (8) 16 or above.

[b] The categories for household income were: (1) Less than $1,000, (2) $1,000-1,500, (3) $1,500-2,000, (4) 2,000-2,500, (5) 2,500-3,000, (6) 3,000-3,500, (7) 3,500-4,000, (8) 4,000-4,500, (9) 4,500-5,000, (10) 5,000-6,000, (11) 6,000-8,000, (12) 8,000-10,000, and (13) $10,000 or more.

[c] The categories for parents' education were: (1) Completed elementary school, (2) Some middle school studies, (3) Completed middle school, (4) Some high school studies, (5) Completed high school, (6) Some community college, (7) Completed college diploma, (8) Some university studies, (9) Completed university degree, (10) Some graduate or professional studies, (11) Completed graduate or professional degree.

[d] N = 60 for the measures of family income and parents' education level.

[e] N = 62 for the measures of family income and parents' education level.

Group Comparison

The results of a series of ANCOVAs are shown in Table III-4. The SK group performed significantly better than the NK group in Syllable deletion, RAN-Letters, vocabulary size, and SK vocabulary after controlling for age, family income, and parents' education. The largest difference was observed in SK vocabulary (η_p^2 = .58). Similarly, all the reading skills were significantly better in the SK group than in the NK group. In contrast, there were no significant differences between the groups in phoneme elision, RAN-Digits, visual spatial relationships, and visual discrimination.

Table III-4

Results of Univariate ANCOVA for the Effect of Group on Each Variable

	Main Effect of Group	
	F (1, 117)	η_p^2
Phoneme elision	.05	.00
Syllable deletion	19.21***	.14
RAN-Letters	11.69***	.09
RAN-Digits	1.75	.01
Visual spatial relationships	.04	.00
Visual discrimination	.28	.00
Vocabulary size	30.29***	.21
SK vocabulary	164.03***	.58
Word reading	13.12***	.10
Pseudo-word reading	13.87***	.11
Reading comprehension	8.70**	.07

Note. Age, family income, and parents' education level were controlled.
η_p^2= eta-squared, a measure of effect size. Value larger than .09 indicate medim effect.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Multigroup Path Analysis

The correlations among the variables are shown in Table III-5.

Table III-5

Correlations Among the Measures in the NK (below diagonal) and SK (above diagonal) Groups

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Phoneme elision		.88**	–.45**	–.50**	.36**	.38**	.05	.86**	–.79**	–.81**	.66**	.03	.02
2. Syllable deletion	.82**		–.50**	–.45**	.35**	.37**	.12	.84**	–.77**	–.80**	.66**	.09	.03
3. RAN-Letters	–.41**	–.44**		.28**	–.17	–.20*	.00	–.53**	.41**	.47**	–.36**	.15	.04
4. RAN-Digits	–.46**	–.45**	.15		–.24*	–.19*	–.18	–.50**	.50**	.41**	–.38**	.00	–.04
5. Visual spatial relationships	.85**	.80**	–.40**	–.41**		.24*	–.02	.37**	–.39**	–.43**	.34**	.00	.11
6. Visual discrimination	.84**	.83**	–.41**	–.47**	.83**		.00	.33**	–.26**	–.38**	.23*	–.22	–.23
7. Vocabulary size	.64**	.63**	–.34**	–.33**	.66**	.65**		–.02	–.09	–.07	.17	–.15	–.17
8. SK vocabulary	.61**	.52**	–.23*	–.23*	.55**	.53**	.05		–.78**	–.76**	.67**	.07	.06
9. Word reading	–.81**	–.77**	.41**	.45**	–.81**	–.86**	–.67**	–.53**		.55**	–.61**	–.09	–.03
10. Pseudo-word reading	–.82**	–.77**	.37**	.43**	–.81**	–.81**	–.54**	–.55**	.68**		–.59**	.06	.02
11. Reading comprehension	.60**	.57**	–.31**	–.38**	.57**	.51**	.49**	.41**	–.55**	–.54**		.04	–.03
12. Family income [a]	.01	.09	–.12	.01	–.04	.15	–.07	.15	–.01	–.07	.18		.66**
13. Parents' education [a]	–.01	–.03	.17	–.03	–.06	–.04	–.22	.11	.01	.06	.01	.07	

Note. [a] $N = 60$ for NK and $N = 62$ for SK.

The cognitive skills and vocabulary were weakly to highly correlated with the reading skills in both groups (|*r*|s = .31–.86 and .26–.81 for the NK and SK groups, respectively), except for vocabulary size in the SK group. In contrast, family income and parents' education were not correlated with the cognitive skills, vocabulary, or reading skills. The results of the multigroup path analysis are shown in Figure 1.

The model fit the data very well, $\chi^2(6) = 7.37$, $p = .29$, CFI = 1.00, TLI = .98, RMSEA = .06, 90%CI [.00, .19], SRMR = .02. PA ($\beta = .38$, $p < .01$) and visual processing ($\beta = .53$, $p < .001$) were uniquely associated with reading fluency in the NK, whereas PA ($\beta = .54$, $p < .001$), visual processing ($\beta = .13$, $p < .05$), vocabulary size ($\beta = .13$, $p < .05$), and SK vocabulary ($\beta = .34$, $p < .001$) were uniquely associated with reading fluency in the SK group. In addition, vocabulary size was significantly associated with reading comprehension in both groups (βs = .46 and .26 for the NK and SK groups, respectively).

Finally, the results of multigroup analysis showed that constraining the path from visual processing to reading fluency caused a significant χ^2 change (SB $\chi^2 = 5.10$, $df = 1$, $p < .05$), indicating that visual processing was more strongly associated with reading fluency in the NK group than in the SK group. In contrast, constraining the path from SK vocabulary to reading fluency caused a significant χ^2 change (SB $\chi^2 = 24.65$, $df = 1$, $p < .001$), indicating that SK vocabulary was more strongly associated with reading fluency in the SK group than in the NK group.

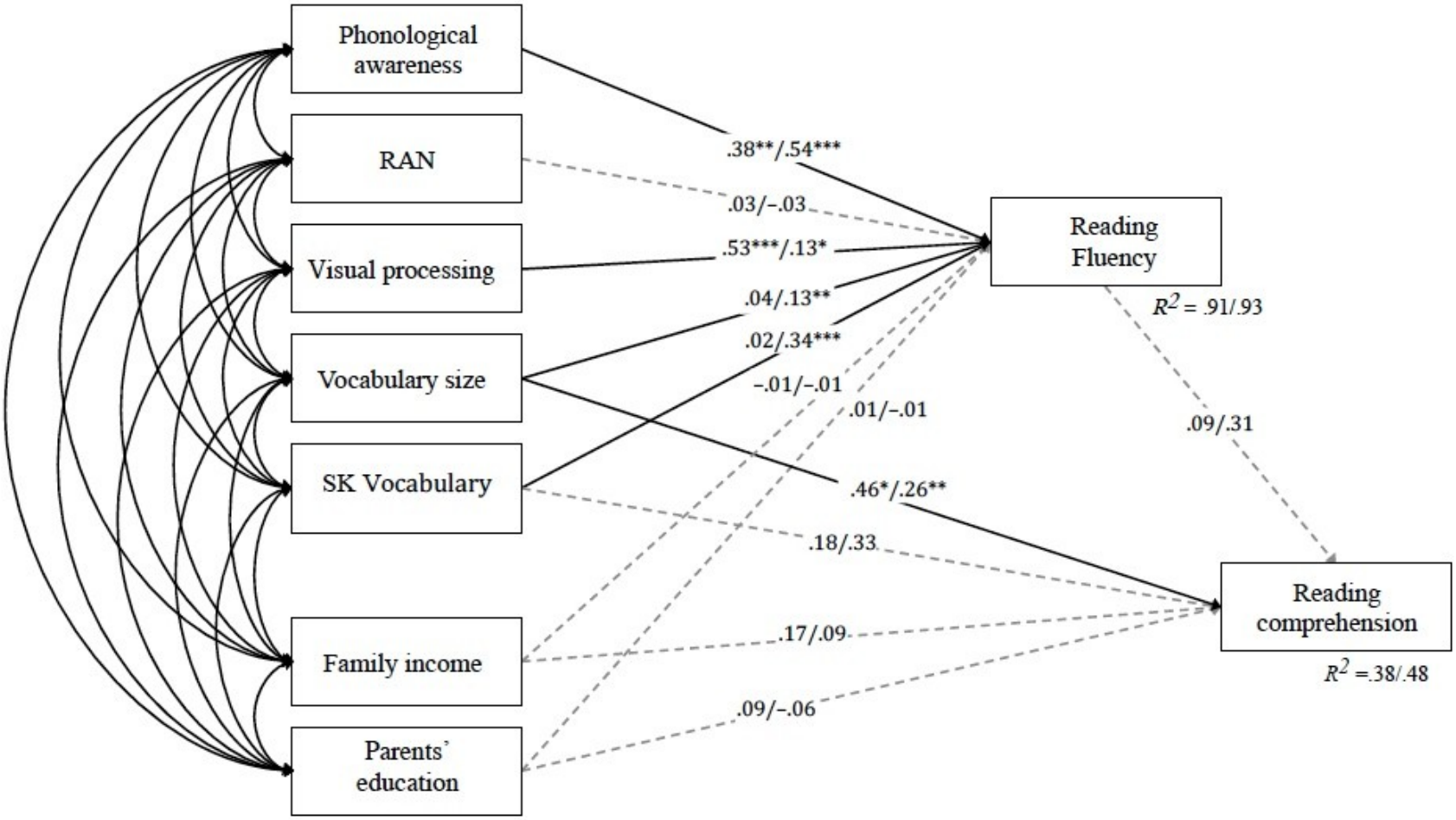

Figure III-1. Results of multigroup path analysis: standardized estimates are shown for the NK (before slash) and SK (after slash) groups. Solid lines represent significant coefficients in either or both groups and dashed lines represent nonsignificant coefficients in both groups.

Discussion of the Results

This study investigated whether linguistic differences between the North and South Korean languages impact the cognitive, linguistic, and reading skills of North Korean students in SK. To do this, we addressed four research questions. The first question was "Are there differences in three cognitive skills − phonological awareness, RAN, and visual skills − between South and North Korean children in SK?" The second examined (South Korean) vocabulary knowledge by asking: "Are there differences in vocabulary knowledge between the two groups?" The third question focused on a separate but parallel set of skills, asking: "Are there differences in three reading skills − word reading, pseudo-word reading, and reading comprehension − between the two groups?" The fourth sought to interpret these findings, by asking: "How are cognitive skills and vocabulary knowledge related to reading performance in the two groups?"

Question 1. Are there differences in three cognitive skills − phonological awareness, RAN, and visual skills − between South and North Korean children in SK?

We found that the South Korean students outperformed their North Korean peers on one of two key aspects of PA, syllable deletion, as well as on the RAN-letter task, even after controlling for age, family income, and parents′ education level. However, there were no significant differences between the two groups in the second major aspect of PA, phoneme elision, or in visual processing skills. A detailed discussion of each of these results follows.

Phonological awareness. Interestingly, the two groups did not differ in phoneme awareness, but did on syllable awareness. The North Korean students made more frequent errors in the syllable deletion task than their South Korean peers. The findings can be explained

by the fact that the orthographic differences between North and South Korean language result in some major modifications that affect syllables, which may lead to key language performance errors (Shon, 1999).

In SK, for example, the Chinese word-initial 르/l/ is not pronounced before the vowel /i/ or the semivowel /yʌ/, and is pronounced /n/ elsewhere. It is spelled as such, 이유 /i.yu/ (reason) and 노인 /no.in/ (the elderly). By contrast, in NK, the word-initial is pronounced /r/ and spelled as such, 리유 /ri.yu/ (reason) and 로인 /ro.in/ (the elderly) (Shon, 1999). In the case of /i.yu/ (/ri.yu/ in NK), deleting /yu/ produced /i/ among South Korean children, but /ri/ among North Korean children.

The experimental syllable awareness task used in this study focused on differences between the two Korean languages. Thus, many of the items might have been unfamiliar to the North Korean students, who speak a form of the language that varies in specific aspects of lexicon, phonology, orthography, semantics, grammar, and usage. In other words, the North Korean students may not have had problems with phonological awareness, but with specific items that they found linguistically strange.

RAN. We found that the North Korean students performed less well than their South Korean peers on the RAN-Letters task, but not on the RAN-Digits task, after controlling for age and SES. If the North Korean students made errors, they usually corrected their erroneous responses by themselves; thus, their average completion time for the RAN-Letters task was longer than that of the South Korean students. These findings may be explained by prior literacy

experiences and instruction. In NK, a consonant letter is taught in an alternative way. This takes the form of the *letter* + *u* (—) , for example, ′nu′ for the letter ㄴ (/n/, ′ni eun′ in SK) (Compendium of Korean Language Norms in North Korea, known as Chosonmal Kyubomjip, 1966). In fact, "nu" is a syllable name of 느 /nu/ in SK. It is possible that North Korean children's visual memory may have led to confusion, misleading them about the naming of consonants.

It should be noted that even though many children in the NK group had not attended North Korean schools, the parents and teachers from NK continued to teach them in the alternative way; for example, teachers from NK who taught North Korean students in South Korean public schools for the North Korean students used this teaching method in the classroom. This was confirmed by the researcher's informal observations and by teachers working in South Korean schools that participated in the present study. Even though there are many North Korean students who were not born in NK, and/or did not have previous schooling in NK, once they had settled in SK, most of them learned consonant letters from their parents and teachers who were born and educated in NK.

Interestingly, in contrast to their performance with RAN-letters, the two groups did not differ in their speed of processing RAN-digits. In NK, a digit is taught in the same way as in SK (Byeon, 2018). This finding thus accords with the explanation of the results of the phonological processing differences discussed above. In other words, the North Korean students, who were learning the South Korean language, might have had no difficulties with RAN per se, but were less adept at automatically processing South Korean letter names. It is also possible that their oral production of the names of the letters was impeded by cross-linguistic transfer as they have

limited knowledge of the South Korean pronunciations.

Visual Skills. The results of the present study indicated no differences between the two groups in visual skills. We expected that the two groups would differ in the visual skills based on the linguistic difference in the direction of writing (Shon, 1999), as words and syllable blocks within them can be written either horizontally from left to right or vertically from top to bottom in SK, but only horizontally in NK.

To our knowledge, this is the first study examining the question of whether the unique visual factors and the two directions of writing affect visual skills. It is plausible that the standardized Visual Spatial Relationships task and the Visual Discrimination task on which the students were tested do not capture the subtle differences in visual processing skills that may result from differences in the way the two Korean languages are written. Future studies will need to establish whether the linguistic difference in the direction of writing influences North Korean children's literacy skills in Korean.

Question 2: Are there differences in vocabulary knowledge between the two groups?

We found that the South Korean students outperformed their North Korean peers on both Vocabulary Size and "SK vocabulary" that specifically targeted lexical differences, even after controlling for age and SES. In addition, of all the measures that were used in this study, SK vocabulary showed the largest difference between the two groups. Our results strongly support prior findings that the biggest difference in language between NK and SK lies in vocabulary (e.g., Ko, 1999; Lee, 1990) and that North Korean students in South Korean schools reported that vocabulary was the main reason for their academic difficulties (e.g., Choe, 2006; Choi, Kwak, Chae, & Park, 2011; Kwon, 2012). In accordance with a wealth of previous research, our findings suggest that it is important to consider linguistic characteristics when examining the

variations in vocabulary knowledge of North Korean students in South Korean schools.

Question 3: Are there differences in reading skills − word reading, pseudo-word reading, and reading comprehension − between the two groups?

The study found that the two groups differed significantly in all three tasks of word reading, pseudoword reading, and reading comprehension: In each case, the reading skills of the South Korean students were significantly better than those of the North Korean students. In the case of the word reading and pseudoword reading tasks, this is not surprising given that the measures contained real words selected from children's Korean language textbooks, as well as pseudo-words containing some modifications in the syllables of the real words employed in the word reading task. We could expect South Korean children to be more familiar with the words we used than North Korean children.

Reading comprehension is an interactive process between the text and the reader's background knowledge (Carrel & Joan, 1983). Considering the North Korean students' demographic characteristics (birth place, length of stay in birth place, previous schooling, length of stay in SK), it is clear that the two groups had different cultural backgrounds, which influenced the accuracy of the students' understanding of the texts. That is, the more information that a group of readers had, the better able that group was to comprehend texts (Yang & Qian, 2017). Our findings align with prior research and suggest that it is important to consider who the North Korean students are, taking into account their prior knowledge.

Question 4: How are cognitive skills and vocabulary knowledge related to reading performance in the two groups?

Path analyses revealed that for the North Korean group, phonological awareness (made by combining phoneme elision and syllable deletion scores) and visual processing (made by

combining the two visual tasks) were uniquely associated with reading fluency (made by combining word and pseudoword reading scores). For the South Korean group, reading fluency was associated with phonological awareness, visual processing and vocabulary. Previous research with South Korean children has shown that phonological awareness is positively associated with word reading (Cho & McBride-Chang, 2005; Cho et al., 2008; Kim, 2007, 2009a); our results confirmed that this is true of North Korean students as well. Vocabulary was modestly related to reading fluency for South Korean students, which is in line with Kim's study (2011) with younger South Korean children.

Visual processing was more strongly associated with reading fluency for the North Korean group than for the South Korean group, whereas vocabulary was more strongly associated with reading fluency for the South Korean students than for their North Korean peers. These results suggest some qualitative differences in how the two groups approached reading fluency tasks. One of these may have resulted from North Korean students' exposure to Chinese orthography. Research with Chinese-speaking children has shown that visual processing predicts reading success at lower grades (Huang & Hanley, 1995; Siok & Fletcher, 2001). These studies suggest that learning to read Chinese progresses from a logographic phase to an orthographic-phonological phase. Hangul, the Korean alphabet, is nonlinear: Unlike characters in an alphabetic writing system, Korean alphabetic characters are arranged top-to-bottom as well as left-to-right in a syllable block. The overall shape of a syllable block is similar to that of Chinese characters (Shin & Kim, 2017).

The results of the current study may reflect the demographic characteristics of the North Korean students who participated. More than 40% of them had gone to school in China, and more than half had lived in China, giving them familiarity with Chinese characters. It may be

the case that this background affected the way they processed syllable blocks. In other words, the North Korean students were more in need of visual recognition and discrimination skills because the configuration of the syllable blocks was less familiar to them, and therefore processing was not automatic. Alternatively, it is possible that exposure to Chinese characters made them more likely to process visually complex syllable blocks as whole characters, which again would increase their reliance on visual skills. Another possibility is due to in part that some words are not written in the same way in the two Koreas, such 리유 in NK but 이유 in SK. For the small orthgraphic differences in the words, North Korean students would be focusing on orthographic knowledge in reading in SK. For this reason, there would be strong relation between visual skills and reading in North Korean students.

In contrast, vocabulary was related to reading fluency more strongly for the South Korean students than for their North Korean peers. A positive relationship between vocabulary knowledge and reading fluency has been reported in studies across languages (Kim, 2011; Laing & Hulme, 1999; Ouellette, 2006, Protopapas, Mouzaki, Sideridis, Kotsolakou, & Simos, 2013; Tunmer & Chapman, 2012). Our finding concurs with a wealth of previous research and suggests that vocabulary size positively influences reading fluency for the South Korean students; however, this was not true of the North Korean students, perhaps reflecting their overall poorer vocabulary skills.

RAN was not uniquely associated with reading fluency in either group. Cho et al. (2008) found that RAN was related to word reading for Korean children aged between four and five years old, even after controlling for vocabulary, PA, visual skills, and morphological awareness. By contrast, the findings of this study are in line with prior findings that RAN was not related to

word reading for children in kindergarten and grades 1 and 2 (Cho & McBride-Chang, 2005; Kim, 2011). Given that our participants were considerably older, jointly these studies suggest that the impact of RAN may be limited to early reading development in Korean.

Vocabulary size was directly associated with reading comprehension, but reading fluency was not. The predictive role of vocabulary size on reading comprehension has been reported in numerous studies from various countries (e.g., Cunningham & Stanovich, 1991, 1997; Davis, 1944; de Jong & vander Leij, 2002; Nagy & Scott, 2000; Muter, Hulme, Snowling, & Stevenson, 2004; Seigneuric & Ehrlich, 2005; Thorndike, 1973). In addition, the crucial role that vocabulary knowledge plays in comprehension of academic texts has been well recognized in the Korean context for North Korean students who are at the elementary and secondary school levels in SK (e.g., Lee, 2008; Jang, 2008, Shin & Kwon, 2011). Furthermore, previous studies (e.g., Won, Suh, Lee, & Kwon, 2011) with students who are from linguistically, culturally, and ethnically diverse backgrounds showed the importance of vocabulary knowledge for comprehension of various texts. Our findings align with these results and suggest that limited vocabulary knowledge (size) may significantly contribute to the academic difficulties North Korean children face in South Korean schools.

It is important to highlight, however, that the SK vocabulary measure did not have a direct association with reading comprehension. A likely explanation for the lack of association is that the SK vocabulary test designed to capture lexical differences between South and North Korean did not capture vocabulary important for the performance on the standardized reading comprehension test (the SK vocabulary barely overlapped with vocabulary in the standardized reading comprehension test). Future studies will need to establish whether the vocabulary difference rather than the vocabulary size influences North Korean children's reading

comprehension in Korean.

In contrast to vocabulary size, reading fluency was not associated with reading comprehension. This finding challenges our theoretical expectation of the reading fluency–reading comprehension relationship. The general consensus is that better reading fluency skill is associated with better reading comprehension performance (Garcia & Cain, 2014; Perfetti, 1985). However, this is not always the case. Some researchers have reported that reading fluency's contribution to reading comprehension was not significant (e.g., Berninger, Abbott, Vermeulen, & Fulton, 2006).

A possible explanation for the absence of the relationship may be the age of the readers. Reading fluency is more likely to contribute to reading comprehension in young readers than in older ones (Keenan et al., 2008). In addition, in a meta-analysis exploring factors that might influence the strength of the relationship between reading fluency and reading comprehension, Garcia and Cain (2013) found that the strength of the relationship decreased as the reader's age increased; they found a reduction in the strength of the relationship at around 10 years of age. Our findings with participants mostly older than 10 concur with this and suggest that age can be a plausible mediator for the relationship.

Conclusion

Although there is a great deal of literature examining the key cognitive processing skills that support literacy acquisition in the Korean language, no study has investigated these skills in relation to linguistic differences between the North and South Korean languages. This study is the first to examine whether North and South Korean students studying in SK differ in three cognitive skills (phonological awareness, RAN, and visual skills), vocabulary knowledge, and word and nonword reading skills and in how these are related to reading performance.

Our results indicate that there are differences between the two groups in their SK vocabulary knowledge (vocabulary size) and reading comprehension skills; however, there are no differences in their three cognitive skills and word and nonword reading skills. Our findings also suggest that the relationships between cognitive skills, vocabulary knowledge, word and nonword reading skills, and reading comprehension vary across the two groups. It is notable that SK vocabulary knowledge varied the most between the two groups. This suggests that South Korean vocabulary knowledge may be a significant factor in addressing the academic difficulties facing North Korean children in South Korean schools. We propose that it is necessary to link this new research on linguistic differences with established research on cognitive and academic skills in examining the challenges North Korean students face in SK.

CHAPTER 4

STUDY 2: RELATIONSHIP BETWEEN HOME LITERACY PRACTICES AND ACADEMIC ACHIEVEMENT

Introduction

As Bourdieu (1991) noted, the social factors that contribute to literacy and academic achievement among grade-school students may include family background, the education system, and the political system. Although numerous studies have demonstrated that a child's home environment has a significant influence on both school performance and emotional well-being (e.g., Caro, McDonald & Willms, 2009; Sanders & Sheldon, 2009; Sheldon, 2009), there has been no research into the association between family background and educational outcomes in the Korean context. This may be an especially important variable to consider in the case of North Korean students studying in South Korea, who face a variety of challenges related to their new cultural and educational contexts. In particular, differences between North Korean students in SK and South Korean students in terms of their home environments may affect the achievement gap between the two groups of students. It is, therefore, important to consider family background in more detail.

The specific social factors on which the current study focused was students' *home literacy environment* (HLE). Early home literacy experiences, such as parental involvement, parent-child interactions, and parental instruction, can play a crucial role in the development of literacy. Various studies have demonstrated these influences. In 1996, for example, a report prepared by the US Department of Education stated that parental involvement was a key factor affecting literacy development. Sénéchal and LeFevre (2002) additionally documented a direct

relationship between early literacy environment at home and later fluent reading, and an indirect relationship between children's early experiences and later reading outcomes. Specifically, Burgess, Hecht, and Lonigan (2002) reported that HLE plays a significant role in improving educational outcomes. They suggested that children benefit from home environments that provide exposure to literacy-related events.

There has, however, been no research examining the HLE of North Korean children in South Korea. In addition, there has been little research related to the HLE of South Korean older readers (school-age students). In one study, Kim (2009b) found a positive association between frequent home-reading and emergent and conventional literacy development. Working with South Korean children (aged between 4 and 5) and their families, Kim confirmed the importance of frequent reading at home for vocabulary and letter-name knowledge, phonological awareness, and word and pseudoword reading in Korean. Kim's findings also suggested that Korean parents were more likely to believe that the teacher has the overall responsibility for children's learning process and literacy acquisition at an early age. This tendency limited the extent of parental involvement in explicit literacy instruction at home. These findings have provided a good understanding of how cultural expectations of literacy acquisition in SK contribute to a child's literacy activities at home.

It is clear that the home can be the primary cause of literacy development for all children, in spite of family background. However, parents differ in their capacity to provide support for their children's educational performance. Although primarily most parents want to help their children do well in school, not all parents are capable of doing so effectively (Epstein, 1986). Furthermore, minority group parents who have experienced discrimination may find it harder to convince their children that extensive effort will be rewarded with social and economic success

(Ogbu, 1991). Moreover, the parents of North Korean students have less direct experience with schooling than the parents of South Korean students. Many North Korean parents failed to complete high school themselves or, if they did, remember school as a difficult and trying experience (Natriello et al., 1990).

The differential educational experience is less important in the early grades; school-related tasks are rather straightforward. However, as children advance in grade, schoolwork increases in complexity, at times exceeding the capacity of parents to help with their children's school tasks. More formal education provides parents better preparation to help their children with homework, to support and acquire special services when necessary, and to assist their children to consider alternative strategies and solutions (Epstein, 1986; Lareau, 1989; Stevenson & Baker, 1987). Mothers play a fundamental role in determining the quantity and quality of home support that children experience because they usually manage their children's education.

In further considering the challenges facing North Korean students in South Korean schools, it is important to explore the associations between their academic achievement and HLE as a part of the overall environment that influences educational outcomes. Specifically, the effect of HLE on the school performance of older students over the age of six is still unclear, and more research is needed.

Key Variables

Variables related to HLE on which the study focused include reading practices, academic interest and support, digital device access and use (among both parents and students), and after-school learning activities (among students alone). Reading practices reflect students' and parents' reading habits. The reading practices investigated in Study 2 considered three kinds of reading materials: books (paper books, eBooks, and audiobooks), magazines and newspapers

(both paper and online formats), and other online digital texts. Academic interest and support is related to reading and talking about schoolwork. The academic interest and support examined in Study 2 sought to clarify how often the students talk about reading with family and friends and how often they discuss their schoolwork with their parents. The digital device access and use explored in this study was designed to gather information about the students' access to digital resources such as digital devices, the internet, and online educational resources. After-school learning activities are related to the types of educational after-school activities in which the student was involved. The after-school education investigated in this study included private after-school tutoring academies (called Hagwons), private one-to-one tutoring, regional community Children's center, one-to-one mentoring programs for academic subjects, and private Hagwons and private one-to-one tutoring for nonacademic activities.

Control Variables

In addition to HLE, which may directly influence academic achievement, two dimensions of family background – socioeconomic status (SES) and demographic characteristics – which may contribute more indirectly to children's success or failure in educational performance were examined as control variables. The two factors are closely integrated, given the substantial economic effects of demographic shifts among North Korean defectors in the past two decades. There has been an increase in the number of both working class and female immigrants, many of whom have fewer employment skills and are less educated. These shifts in social backgrounds suggest that defectors face new challenges to integration into SK. Their social positions, for example, are directly linked with low-income status in SK. After they arrive in the South, North Korean families are one of the primary beneficiaries of the National Basic Livelihood Security Program. Most families from NK (close

to 95%) earn a monthly income of less than $1,500 USD, and 66.7% make less than $1,000 USD (Han et al., 2009).

Other factors that impact academic achievement are related to the demographic profiles of North Korean students include their place of birth, the regions that they come from, their school ages, and the family members with whom they live. With respect to birthplace, many female defectors take their children to the South or give birth in other countries such as China (Ministry of Education, Science, and Technology, 2013). In the case of the latter group, North Korean students may also disproportionately come from certain regions of the country, especially those close to the Chinese border.

Furthermore, because students may miss one to three years of study during their long journey to SK, they may be two to three years older than their South Korean classmates. This may result in lower levels of educational attainment and low graduation rates, given that the age of a student plays a significant role in their motivation to learn and their educational progress (Han et al., 2013; Kim, 2004; Ministry of Education, Science, and Technology, 2013). Han et al. (2013) additionally classified families from North Korea based on the presence or absence of a parent: 46.2 percent of the 429 students who participated in the study lived with both parents in the home; 42 percent with their mother; 3.5 percent with their father; and 8.3 percent without either parent.

Research Questions

The current study examined first how the two groups differed in academic achievement, second how the two groups differed in their home literacy practices (HLP), and third whether the four HLP dimensions can account for the observed differences in academic achievement. Thus, seven specific research questions guided the analysis:

Question 1. Are there differences in academic achievement between the North and the South Korean students?

Question 2.1. Are there differences in home literacy practices as reported by parents?

Question 2.2. Do those differences in the parents' HLP reflect SES?

Question 3.1. Are there differences in HLP as reported by students?

Question 3.2. Do those differences in the students' HLP reflect SES?

Question 4.1. How do SES and HLP variables predict academic achievement?

Question 4.2. Are the relationships between academic achievement, SES, and HLP different across the two groups?

Methods

Participants

This study included a total of 194 North and 151 South Korean students (the same students as in Study 1). The students were asked to fill a home literacy practices (HLP) questionnaire (see Appendix E.1). All of the students responded to the questionnaire. Their parent(s)/guardian(s) (hereafter referred to as parents) were also asked to fill a parents' HLP questionnaire (see Appendix E.2). Of the 194 North Korean students' parents surveyed, 103 (53%) responded to the HLP questionnaires. Of the 151 South Korean students' parents surveyed, 146 (97%) responded to the parents' HLP questionnaire. Finally, 21 teachers (seven from the North and 14 from the South) were asked to fill out a teacher's questionnaire (see Appendix E.3).

Demographic characteristics. Table IV-1 shows descriptive statistics for the North and South Korean students' demographic characteristics.

Table IV-1

Descriptive Statistics for the North and South Students' Demographic Profiles

Characteristic		NK (*n* = 194) N (%)	SK (*n* = 151) N (%)
Gender			
	Girl	99 (51.0)	75 (49.7)
	Boy	95 (49.0)	76 (50.3)
Grade			
	In grades 3-6 (Elementary school)	133 (68.6)	62 (41.1)
	In grades 7-8 (Middle school)	61 (31.4)	89 (58.9)
Age			
	Under 10	13 (6.7)	5 (3.3)
	10	19 (9.8)	20 (13.2)
	11	28 (14.4)	14 (9.3)
	12	31 (16.0)	11 (7.3)
	13	26 (13.4)	14 (9.3)
	14	31 (16.0)	36 (23.8)
	15	16 (8.2)	51 (33.8)
	16 or above	30 (15.5)	0 (0)
Living situation in SK [a]			
	Siblings	39 (20.1)	105 (69.5)
	A parent	75 (38.1)	16 (10.6)
	Parents	109 (56.2)	135 (89.4)
	Guardian	8 (4.1)	0 (0)
	Relatives	13 (6.7)	0 (0)

[a] The participants selected all that applied.

North Korean students (99 girls and 95 boys) included 133 elementary school students (in grades 3-6) and 61 middle school students (in grades 7-8). South Korean students (75 girls and 76 boys) included 62 elementary school students (in grades 3-6) and 89 middle school students (in grades 7-8). The percentage of students aged 13 or under (in grades 3-6) and students aged 14 or above (in grades 7-8) was 61.3% vs. 42.4%, and 39.7% vs. 57.6% for NK vs. SK, respectively.

The North and South Korean students differed significantly in their living situations: 20%

of North Korean students lived with their sibling(s) as opposed to 70% of the South Korean students; 38% of the North Korean students lived with a parent vs. 11% of the South Korean students; 56% of the North Korean students lived with both parents vs. 89% of the South Korean students; 11% of North Korean students lived with a guardian or relatives vs. zero percent of the South Korean students. Table IV-2 reports the demographic profile among the North Korean students alone.

Of the total of 194 North Korean students, 78 (40.2%) were born in NK, where four (5.1%) had lived for less than one year, 14 (18.0%) for one to five years, 27 (34.6%) for five to nine years, and 33 (42.3%) for nine years or more before arriving in SK. One-hundred-and-twelve (57.7%) were born in China, where 10 (8.9%) had lived for less than one year, 18 (16.1%) for one to five years, 50 (44.6%) for five to nine years, and 34 (30.3%) for nine years or more before arriving in SK. Four were born in other countries, where three had lived for less than one year and one had lived one to three years before arriving in SK. All of the South Korean students were born in SK.

Of the 194 North Korean students, 72 (37.1%) did not attend school before their arrival in SK, two did not remember whether they had previous schooling, and 120 (61.9%) had attended schools either before or after leaving NK. Of the 120 students with previous schooling, 42 (35%) attended North Korean schools, 77 (64.2%) attended Chinese schools, and one (0.8%) attended school in another country.

Table IV-2

Descriptive Statistics for the North Korean Students' Demographic Profiles

Characteristic		N (%)
Birth Place		
	NK	78 (40.2)
	China	112 (57.7)
	Other	4 (2.0)
Length of stay [a]		
NK	Less than 1 year	4 (5.1)
	1-5 years	14 (18.0)
	5-9 years	27 (34.6)
	9 years or more	33 (42.3)
China	Less than 1 year	10 (8.9)
	1-5 years	18 (16.1)
	5-9 years	50 (44.6)
	9 years or more	34 (30.3)
Other	Less than 1 year	3 (75)
	1-3 years	1 (25)
Previous Schooling		120 (61.9)
	NK	42 (35.0)
	China	77 (64.2)
	Other	1 (.83)
Highest Grade		
NK	Only attended kindergarten	16 (38.0)
	Grade 1 - 4 (elementary school level) [b]	23 (54.8)
	Grade 5 - 6 (middle school level)	3 (7.2)
China	Only attended kindergarten	25 (33.3)
	Grade 1 - 6 (elementary school level)	40 (53.4)
	Grade 7 - 9 (middle school level)	10 (13.4)
Other	Grade 2	1 (100)
Length of stay in SK [c]		
	Less than 1 year	34 (17.5)
	1-3 years	53 (27.3)
	3-5 years	43 (22.2)
	5 years or more	63 (33.0)

[a] The categories for the length of stay in NK, China, or other countries were: (1) less than 1 year, (2) 1-3 years, (3) 3-5 years, (4) 5-7 years, (5) 7-9 years, (6) 9-11 years, (7) 11 years or more.
[b] The North Korean school system consists of three stages: one year of kindergarten, four years of primary school, and six years of secondary school.
[c] The categories for the length of stay in SK were: (1) less than 1 year, (2) 1-2 years, (3) 2-3 years, (4) 3-4 years, (5) 4-5 years, (6) 5 years or more.

Among the NK-born students, sixteen only attended kindergarten, 23 (54%) received some elementary school education or completed elementary school, and three (7.2%) received some middle school education or completed middle school in NK. As predicted, these numbers were considerably lower than those of the Chinese-born students 25 (33.3%) of whom attended kindergarten, 40 received some elementary school studies or completed elementary school, and 10 (13.4%) received some middle school studies or completed middle school in China. Thirty-four (17.5%) North Korean students had been living in SK for less than one year, 53 (27.3%) for one to three years, 43 (22.2%) for three to five years, and 63 (33.0%) for five years or more.

Measures

Home literacy practices. Two HLP questionnaires (one for parents/guardians, the other for students) were developed by the researcher. The parent questionnaire had three parts and the student questionnaire had four parts. These questions were used to identify HLPs that may affect the achievement gap between North and South Korean students.

Parent/Guardian questionnaire on HLP. The parental survey (see Appendix E.2) was designed to obtain a better understanding of parents' HLPs. It was divided into three parts: (1) reading practice, (2) reading interest and support, and (3) digital device access and use. For each question, parents chose the response that best described their literacy practices. Before being used formally, the questionnaire was administered to a group of eight North Korean mothers and four South Korean mothers in Chungnam province (South Korea) to ensure that there were no ambiguous words or instructions that would make it difficult to complete or would contribute to participant survey fatigue.

Reading practice. The questions about reading practice focused on parents' reading habits. They addressed three kinds of reading materials: books, magazines and newspapers, and

online digital texts. The reading practice scale consisted of 13 questions and was measured on a mixture of a dichotomous scale (one = no, two = yes) and a five-point Likert scale ranging from one (e.g., never) to five (e.g., daily). Cronbach's alpha reliability coefficient was .87.

The books included those in three formats – paper books, eBooks, and audio-books. Eight questions were used to determine indicators of parents' book-related activities. These questions were as follows: (1) how many hours per week do you read books? (2) how many of your own books do you have in your home? (3) how much money per month do you spend on your own books? (4) how much money per month do you spend on your child's books? (5) do you own a public library card? (6) how often do you visit your public library? (7) how many public library books per month do you borrow for yourself? and (8) how often do you look for books in local or online bookstores?

The questions about reading magazines and newspapers included both traditional and online digital formats. Four questions were used to determine indicators of parents' magazine-and-newspaper-related activities. These questions were as follows: (1) how many hours per week do you read magazines? (2) do you subscribe to a magazine? (3) how many hours per week do you read newspapers? and (4) do you subscribe to a newspaper? The online digital texts included all the written work (other than eBooks and digital magazines and newspapers mentioned above) that parents could find on the internet, on their computer, or on a variety of hand-held electronic devices. One question was used to determine online digital text-related activities for parents: how many hours per week do you read digital texts (e.g., Facebook, webtoons, blogs)?

Academic interest and support. The questions about academic interest and support were designed to obtain information about how often parents talked about reading with their children

and how often they interacted with their children regarding schoolwork. The academic interest and support scale consisted of seven questions measured on a five-point Likert scale ranging from one (never) to five (daily). Cronbach's alpha reliability coefficient was .90.

Two questions were used to determine indicators of talking about reading. These questions were as follows: (1) how often do you ask your child what he/she is reading? and (2) how often do you discuss with your child what he/she reads? Five questions were used to determine indicators of talking about schoolwork. These questions were as follows: (1) how often do you help your child with his/her homework? (2) how often do you have a conversation with your child about what happened in school (e.g., participating in group lessons, asking questions in your classroom, and helping other students)? (3) how often do you have a conversation with your child about what he/she learned in school? (4) how often do you have a conversation with your child about his/her academic progress? and (5) how often do you have a conversation with your child about strategies for increasing his/her academic achievement?

Digital device access and use. The questions about digital device access and use were designed to obtain information about the parents' access to digital resources. Seven questions were used to determine indicators of access to digital resources, and were measured on a mixture of a dichotomous scale (one = no, two = yes) and a five-point Likert scale ranging from one (e.g., zero) to five (e.g., two hours or more). Cronbach's alpha reliability coefficient was .34.

The questions were as follows: (1) do you have your own computers (e.g., desktops or laptops), tablets (e.g., iPads), or mobile devices (e.g., iPods or electronic book readers) in your home? (If yes, they marked all boxes that apply: desktop, laptop, tablet, MP3 player, iPod, electronic book reader, Smartphone, others) (2) do you have access to the internet in your home? (3) on average, how many hours per day do you spend on the internet in your home? (4) on

average, how many hours per day does your child spend on the internet in your home? (5) do you and your child utilize online educational resources? (If yes, they marked all boxes that apply: textbooks, video lessons/tutorials, foreign language lesson, test prep materials, YouTube, web resources in academic subjects, educational apps/games/websites, others) (6) how many hours per day do you and your child utilize online educational resources? and (7) do you limit your child's screen time?

Students' HLP questionnaire. The student survey (see Appendix E.1) was designed to generate a better understanding of students' HLP. It was divided into four parts: (1) reading practices, (2) academic interest and support, (3) digital device access and use, and (4) after-school learning. For each question, students chose the response that best described their literacy practices. Before being used formally, the questionnaire was administered to a group of eight elementary school and 10 middle school students (13 from NK and five from SK) in Gyeong-gi province and Seoul (South Korea) to ensure that there were no ambiguous words or instructions that would make it difficult to complete or would contribute to participant survey fatigue.

*Reading practices***.** The questions about reading practices focused on students' reading habits. The questions addressed three kinds of reading materials: books, magazines and newspapers, and online digital texts. The reading practice scale consisted of 18 items and included one dichotomous item (one = no, two = yes) and 17 items measured on five-point Likert scales ranging from one (e.g., never) to five (e.g., daily). The internal consistency (Cronbach's alpha) of the reading practice scale was .82.

The books included three formats – paper books, eBooks, and audio-books. Twelve questions were used to determine indicators of students' book-related activities. These questions were as follows: (1) how many hours per day do you read books outside of school during the

school year? (2) how many hours per day do you read books during vacations? (3) how many of your own books do you have in your home? (4) do you have a public library card? (5) how often do you visit your public library during the school year? (6) how often do you visit your public library during vacations? (7) how many public library books per month do you borrow during the school year? (8) how many public library books per month do you borrow during vacations? (9) how often do you look for books in bookstores during the school year? (10) how often do you look for books in bookstores during vacations? (11) how often do you look for books in online bookstores during the school year? and (12) how often do you look for books in online bookstores during vacations?

The magazines and newspapers in question included those in both paper and online digital formats. Four questions were used to determine indicators of students' magazine-and newspaper-related activities. These questions were as follows: (1) how many hours per week do you read magazines during the school year? (2) how many hours per week do you read magazines during vacations? (3) how many hours per week do you read newspapers during the school year? and (4) how many hours per week do you read newspapers during vacations?

The online digital texts included all the written work (other than eBook and digital magazines and newspapers mentioned above) that students could find on the internet, their computers, or on a variety of hand-held electronic devices. Two questions were used to determine indicators of online digital text-related activities. These questions were as follows: (1) how many hours per day do you read digital texts (e.g., Facebook, webtoons, blogs) during the school year? and (2) how many hours per day do you read digital texts during vacations?

Academic interest and support. The questions about academic interest and support focused on discussions about reading and schoolwork. They sought to clarify how often the

students talk about reading with family and friends and how often they talk with their parents about their schoolwork. The academic interest and support scale consisted of nine items and was measured on a five-point Likert scale ranging from one (never) to five (daily). Cronbach's alpha reliability coefficient was .82.

Four questions were used to determine indicators of talking about reading. These questions were as follows: (1) how often does/do your parent(s)/guardian(s) show interest in what your read? (2) how often do you discuss what you read with your parent(s)/guardian(s) or other family members? (3) how often do you discuss what you read with your friends? and (4) how often do you discuss what you read with other people (e.g., private instructors and mentors)?

Five questions were used to determine the extent of talking about schoolwork. These questions were as follows: (1) how often does/do your parent(s)/guardian(s) help you with your homework? (2) how often do you have a conversation with your parent(s)/guardian(s) about what happened in school (e.g., participating in group lessons, asking questions about your classroom, and helping other students)? (3) how often do you have a conversation with your parent(s)/guardian(s) about what you learned in school? (4) how often do you have a conversation with your parent(s)/guardian(s) about your academic progress? and (5) how often do you have a conversation with your parent(s)/guardian(s) about strategies for increasing your academic achievement?

Digital device access and use. The questions about digital device access and use were designed to gather information about the students' access to digital resources. The digital device access and use scale consisted of 12 questions and included a mixture of a dichotomous scale (one = no, two = yes) and a five-point Likert scale ranging from one (e.g., zero) to five (e.g.,

two hours or more). Cronbach's alpha reliability coefficient was .76.

These questions were as follows: (1) do you have your own computers (e.g., desktops or laptops), tablets (e.g., iPads), or mobile devices (e.g., iPods or electronic book readers) in your home? (If yes, they marked all boxes that apply: desktop, laptop, tablet, MP3 player, iPod, electronic book reader, Smartphone, others) (2) do you have access to the internet in your home? (3) on average, how many hours per day do you spend on the internet in your home during the school year, (4) on average, how many hours per day do you spend on the internet in your home during vacations? (5) do you utilize online educational resources during the school year? (If yes, they marked all boxes that apply: textbooks, video lessons/tutorials, foreign language lesson, test prep materials, YouTube, web resources in academic subjects, educational apps/games/websites, others) (6) do you utilize online educational resources during vacations? (If yes, they marked all boxes that apply) (7) how many hours per day do you utilize online educational resources during the school year? (8) how many hours per day do you utilize online educational resources during vacations? (9) on average, how many hours per day do you spend in front of screen (e.g., playing video games, watching non-educational TV programming, surfing the web, or texting or chatting on your smartphones) during the school year? (10) on average, how many hours per day do you spend in front of screen during the vacations? (11) how many hours per day does/do your parent(s) limit your total screen time during the school year? and (12) how many hours per day does/do your parent(s) limit your total screen time during vacations.

After-school learning. The questions related to after-school learning focused on the types of after-school learning activities in which the student was involved. These included private after-school tutoring academies (called Hagwons), private one-to-one tutoring, Regional

Children's center (지역아동센터, hereafter refered to as Children's center), and one-to-one mentoring programs for academic subjects, and private Hagwons and private one-to-one tutoring for nonacademic activities. Twenty-four questions (16 for academic subjects and eight for nonacademic activities) were used to determine indicators of after-school learning and activities. The categories for the academic subjects included mathematics, English, science, social studies, and Korean language. The categories for nonacademic activities included music, arts, and sports.

Similar to the digital-device-access-and-use scale, the after-school learning scale included a mixture of a dichotomous scale and a five-point Likert scale. Sample items were *Do you attend Hagwons for academic subjects during the school year* (measured on a dichotomous scale: one = no, two = yes), and *How many hours per day do you spend in the Hagwons during the school year* (measured on a five-point Likert scale: one = one hour or less, two = two to three hours, three = three to four hours, four = four to five hours, five = five hours or more). Cronbach's alpha reliability coefficient was .64.

Academic achievement. Two sources of academic achievement were obtained for each student: the student's grade point average (GPA) of the 2016 first semester midterm exam and the teacher's ratings of each student's school outcomes. The student's objective academic achievement was assessed based on the results (the average of the grades obtained by the student in all subjects) of the 2016 first semester midterm exam. The second source of academic performance was a report from the student's teacher. Teachers completed a survey for each student who participated in the study. Five questions were used to determine indicators of academic achievement. These items required the teacher to report how the student was

performing in (1) Korean language, (2) mathematics, (3) English, (4) science, and (5) social studies. Cronbach's alpha reliability coefficient was .95.

Procedure

Because the participants in this study were the same as those in Study 1, the procedure of how the data were collected and the sample was recruited was the same (see Method Section-Procedure in Study 1). The parent questionnaire was sent home with the students on a single occasion. The parents were not observed while filling their questionnaire. The HLP questionnaire for students was administered to groups of approximately 10 students during class time in the schools on a schedule provided by school principals. Each student was asked to complete the questionnaires in approximately 45 minutes in the presence of the researcher or a research assistant. The teacher survey, with questions about students' performance in specific academic subject areas, was distributed on a single occasion to the teachers.

Results

Q1. Are there differences in academic achievement between the North and the South Korean students?

Descriptive Statistics

The descriptive statistics of academic achievement are reported separately for the North and South Korean students in Table IV-3.

Table IV-3 indicates that the North Korean students had lower GPAs and other educational outcomes than their South Korean peers.

Table IV-3

Descriptive Statistics for Academic Achievement for the North and South Korean Students

	NK (n = 194)				SK (n = 151)			
	M	*SD*	*Min*	*Max*	*M*	*SD*	*Min*	*Max*
Five-point Likert scale [a]								
GPA	2.12	.89	1	5	2.71	1.18	1	5
Korean language	2.28	1.03	1	5	2.76	1.12	1	5
Math	2.19	1.01	1	5	2.79	1.28	1	5
English	1.82	.90	1	4	2.87	1.24	1	5
Science	2.11	.78	1	4	2.80	1.21	1	5
Social studies	2.11	.83	1	4	2.93	1.21	1	5

Note. GPA=grade point average; M=mean; SD=standard deviation.
[a] The scale points were: (1) poor (2) fair (3) good (4) very good (5) excellent.

Next, we examined to what extent the observed academic achievement differences reflect different age and socio-economic situations of the two groups of students in the study. A MANCOVA with age as a covariate showed a main effect of group, F (6, 337) = 21.74, p < .001, η_p^2 = .28, and a significant effect of age, F (6, 337) = 5.19, p <.000, η_p^2 = .09. When SES was added as a covariate, the main effect of group remained significant, F (6, 337) = 4.62, p < .001, η_p^2 = .15. The effect of age was not significant, F (6, 337) = 1.75, p = .114, η_p^2 = .06, whereas the effect of SES was, F (6, 337) = 7.51, p < .001, η_p^2 = .23. The results of the subsequent of ANCOVAs are shown in Table IV-4.

The ANCOVAs indicate that the observed academic achievement differences are largely explained by SES. Interestingly, the academic achievement in social studies of the South Korean students was significantly better than that of their North Korean peers, even after controlling for age and SES. This is likely due to substantial differences between the school curriculum in SK and the school curriculums in NK and China; of special importance, there is no social studies in the school curriculum at primary and secondary levels in NK.

Table IV-4

Results of ANCOVAs for the Effect of Group on Academic Achievement

Controlling for Age [a]		F (1, 342)	η_p^2
	GPA	33.02***	.09
	Korean language	20.59***	.06
	Math	29.76***	.08
	English	86.28***	.20
	Science	49.48***	.13
	Social studies	62.12***	.15
Controlling for Age and SES [b]		F (1, 159)	η_p^2
	GPA	.18	.00
	Korean language	2.02	.01
	Math	1.31	.01
	English	3.58	.02
	Science	1.34	.01
	Social studies		.05

Note. [a] $N = 345$. [b] $N = 163$.
*$p < .05$, ** $p < .01$, *** $p < .001$.

Q2.1. Are there differences in home literacy practices as reported by parents?

Preliminary Data Analysis of Likert-scale Items

Descriptive statistics. The descriptive statistics for all the Likert-scale questions in parents' HLP questionnaire are shown in Table IV-5.

Table IV-5

Descriptive Statistics for the Likert-scale Questions of Parents' HLP Questionnaire

Question	NK (n = 103)				SK (n = 146)			
	M	*SD*	*Min*	*Max*	*M*	*SD*	*Min*	*Max*
Reading Practices								
Book reading	1.41	.60	1	3	2.84	1.43	1	5
Number of parent's books	1.00	.00	1	1	1.64	.90	1	5
Money for parent's books	1.11	.31	1	2	1.82	1.06	1	5
Money for children's books	1.28	.47	1	3	2.11	1.14	1	5
Library visits	1.16	.36	1	2	2.04	.97	1	5
Library books	1.14	.34	1	2	1.84	1.05	1	5
Bookstore visits	1.23	.43	1	2	1.83	.78	1	5
Magazine reading	1.30	.48	1	3	2.01	1.33	1	5
Newspapers reading	1.14	.40	1	3	1.75	1.10	1	5
Digital text reading	1.77	.82	1	4	2.45	1.10	1	5
Subscription magazine/newspapers	0	0	0	0	.36	.67	0	2
Academic Interest/Support								
Talking about reading	1.46	.75	1	4	2.84	1.28	1	5
Discussion reading	1.12	.32	1	2	2.48	1.27	1	5
Helping homework	1.28	.62	1	4	2.47	1.35	1	5
Talking about school activities	2.80	1.30	1	5	3.64	1.16	1	5
Talking about school learning	2.09	1.05	1	5	3.57	1.20	1	5
Talking about academic progress	2.24	1.03	1	5	3.47	1.16	1	5
Talking about academic strategy	1.65	.84	1	4	3.27	1.24	1	5
Digital Device Access/Use								
Parents' internet time	4.07	.94	2	5	2.93	1.30	1	5
Children's internet time	3.10	1.03	1	5	3.39	1.44	1	5
Educational resource use	1.10	.30	1	2	1.29	1.55	0	5
Number of digital devices	1.31	.73	1	5	2.79	1.31	0	6
Number online educational program	.19	.67	0	3	1.10	1.49	0	5

Principal component analysis. To reduce the number of data points, the items with five-point Likert scales were factor analyzed using principal component analysis (PCA) and direct oblimin rotation. Factor scores were saved for further analyses using regression method.

Reading practice. The results of PCA of the questions about reading practice are shown in Table IV-6.

Table IV-6

Results of Principal Component Analysis of Reading Practices of Parents' HLP Questionnaire

	Factor			
	Factor 1	Factor 2	Factor 3	Cronbach's
	Investment in Books	Library & Bookstore Visits	Reading	α
Money for parent's books	.88			.82
Money for children's books	.84			
Number of parent's books	.83			
Library visits		.92		.76
Library books		.91		
Bookstore visits		.36		
Newspapers reading			.98	.77
Magazine reading			.77	
Book reading			.49	
KMO (Kaiser Meyer Olkin)				.79
Bartlett Test of Sphericity			Chi-square	1078.74
			df (*p*)	36(.000)

Communalities for the question of *Digital text reading* were low (.37), and the question was removed and analyzed separately. After removal, the analysis yielded three factors explaining a total of 73.0% of the variance for the nine variables.

Factor 1 was labeled *Investment in Books* due to high loadings from three items related to books: money spent on parents' books and children's books, and the number of parents' books. Factor 2 was labeled *Library & Bookstore Visits* due to high loadings from three items related to

library and bookstore: library visits, library books, and bookstore visits. Factor 3 was labeled *Reading* due to high loadings from three items related to reading: the number of hours for book, magazine, and newspapers reading. The three factors explained 49.2%, 12.5%, and 11.4% of the variance and Cronbach's αs were .82, .76, and .77, respectively. Investment in Books correlated .45 with Library & Bookstore Visits and .46 with Reading, whereas the correlation between the latter two was .37.

Academic interest and support. The results of PCA of the questions about academic interest and support are shown in Table IV-7.

Table IV-7

Results of Principal Component Analysis of Reading Interest /Support of Parents' HLP Questionnaire

	Factor 1 Academic Interest & Support	Cronbach's α
Talking about school learning	.86	.90
Talking about academic progress	.83	
Discussion reading	.82	
Talking about reading	.81	
Talking about academic strategy	.80	
Talking about school activities	.69	
Helping homework	.67	
KMO (Kaiser Meyer Olkin)		.87
Bartlett Test of Sphericity	Chi-square	999.566
	df (*p*)	21(.000)

The analysis yielded one factor explaining a total of 61.2% of the variance for the seven variables. Cronbach's α was .90.

Digital device access and use. Five items were analyzed, including three Likert-scale items about *Children's internet time*, *Parents' internet time*, and *Online educational resource*

use and two composite-scale (individual item scores, either 0 or 1, are added to provide a composite scale score) items about *Number of digital devices* and *Number of online educational programs*. However, because the internal consistency coefficient of the dimension of digital device access and use was not acceptable (Cronbach's α = .40; > .60 acceptable as a rough guide; Pallant, 2007), it was not appropriate to include all the items in a composite scale, rather each item with Likert scales in the questionnaire was examined individually.

Group Comparison

The results of a series of ANCOVAs comparing the two groups of the HLP factors and questions after controlling for age are shown in Table IV-8.

Table IV-8

Results of ANCOVAs for the Effect of Group on Each Factor of Parents' HLP Questionnaire

	NK (n =103)		SK (n = 146)			
Controlling for Age	*M*	*SD*	*M*	*SD*	F (1, 246)	η_p^2
Reading Practices						
Investment in Books	-.58	.24	.41	1.13	62.03***	.20
Library & Bookstore Visits	-.58	.35	.41	1.10	70.18***	.22
Reading	-.47	.35	.33	1.16	45.60***	.16
Digital text reading	1.77	.82	2.45	1.10	25.30***	.09
Academic Interest and Support	-.76	.45	.54	.93	169.19***	.41
Digital Device Access and Use						
Parents' internet time	4.07	.94	2.93	1.30	65.33***	.21
Children's internet time	3.10	1.03	3.39	1.44	1.11	.00
Online educational resources	1.10	.30	1.29	1.55	2.34	.01
No. digital devices	1.31	.73	2.79	1.31	106.39***	.30
No. online educational program	.19	.67	1.10	1.49	38.61***	.14

Note. Age was controlled.
*p < .05, ** p < .01, *** p < .001.

The two groups differed on the three factors of *Investment in Books*, *Library & Bookstore visits*, and *Reading*, and the two items of *Digital text reading* and *Subscription*

magazine/newspapers with South Korean parents reporting more frequent book and digital text reading, more access to books, more money spent on books, and more subscriptions of magazine/newspapers. Additionally, the two groups differed on their Academic Interest and Support with South Korean parents reporting more supports for their children's school work, and more frequent conversations about reading with their children. The results also showed a significant effect of the group on *Parents' internet time*, indicating that the North Korean parents spent more time on the internet. By contrast, the South Korean parents reported more digital devices and more online educational programs utilized with their children. No significant effect of the group on *Children's internet time* and *Online educational resource use* was found after controlling for age.

Descriptive Statistics of Items with Dichotomous Scales

The descriptive statistics for all the dichotomous scales on the parents' HLP questionnaire are shown in Table IV-9.

Table IV-9

Descriptive Statistics of Dichotomous Questions of Parents' HLP Questionnaire

	NK (n = 103)		SK (n = 146)	
Dichotomous Scale	N	%	N	%
Library card ownership	12	11.7	78	53.4
Digital device ownership	103	100	145	99.3
Home internet access	103	100	141	96.6
Online educational program	10	9.0	66	45.2
Screen time limits	26	25.2	119	81.5

Group Comparison

Chi-square tests showed that there were significant differences between the groups in

three variables of library card ownership, $X^2(1, N = 249) = 45.66$, $p < .001$, online educational resources use, $X^2(1, N = 249) = 35.88$, $p < .001$, and screen time limits, $X^2(1, N = 249) = 78.61$, $p < .001$; however, there were no differences in digital device ownership (whether they have their own computers or mobile devices) and home internet access (whether they have access to the internet in their home) – almost all parents had a digital device and access to internet at home.

Q2.2. Do differences in the parents' HLP reflect SES?

The results of a series of ANCOVAs after controlling age and SES are shown in Table IV-10. As SES data was not available for all participants, these analyses were performed with a subsample of all parents.

Table IV-10

Results of ANCOVAs for the Effect of Group on Each Factor of Parents' HLP Questionnaire

	NK (n =101)		SK (n = 62)			
Controlling for Age and SES	*M*	*SD*	*M*	*SD*	*F* (1, 159)	η_p^2
Reading Practices						
Investment in books	-.31	.83	.04	.78	3.24	.02
Library & bookstore visits	-.30	.83	.30	.92	3.28	.02
Reading	-.37	.50	.55	1.44	15.83***	.09
Digital text reading	1.76	.83	2.42	.98	7.48**	.05
Academic Interest and Support	-.47	.87	.47	.88	15.87***	.09
Digital Device Access and Use						
Parents' internet time	4.07	.95	2.56	1.24	25.25***	.14
Children's internet time	3.10	1.03	3.05	1.43	2.05	.01
Online educational resources	1.10	.30	1.52	1.47	.12	.00
No. digital devices	1.43	.86	3.02	1.29	32.12***	.17
No. online educational program	.31	.88	1.47	1.60	7.50**	.05

Note. Age and SES were controlled.
*$p < .05$, ** $p < .01$, *** $p < .001$.

The ANCOVAs indicate that the observed differences in *Investment in Books* and *Library/Bookstore Visits* are largely explained by SES. In contrast, there were significant differences between the two groups of parents in five areas, even after controlling for SES: (a) Reading (paper books, eBooks, and audiobooks); (b) Digital text reading; (c) Academic interest/support; (d) parents' internet time; (e) the number of digital devices; and (f) the number of online educational resources used with their children. The South Korean parents reported more reading in all formats, more parental academic interest and support, more digital devices for themselves, and more online educational resource utilized with their children, and the North Korean parents reported more time spent on the internet in their home. These results indicate that only some of the observed differences between the two groups reflect SES differences.

For the dichotomous questions, we wanted first to control SES. The mean of z-scores of income and parents' educational level was calculated. Then, those scores were matched between the two groups (NK: $M = .11$ and SK: $M = .11$). Twenty-three parents who had high SES (the mean of -.16 to .39) for NK were chosen and compared to 25 parents who had low SES (the mean of -.40 to .59) for SK. For controlling for age, we compared the two subgroups ($N = 48$) on age, and no significant difference in age was found. The results of Chi-square tests showed that there were no differences in online educational resources use after controlling for SES. By contrast, two variables showed a significant difference with the smaller samples controlled for age and SES: library card ownership, $X^2(1, N = 48) = 5.56$, $p = .018$, and screen time limit (whether parents limit their children's screen-time), $X^2(1, N = 48) = 15.07$, $p < .001$, indicating that more South Korean parents reported owning a library card and limiting screen time for their children. Our findings suggest that these observed differences between the two groups reflect differences between the two groups of parents rather than SES differences.

Q3.1. Are there differences in HLP as reported by students?

Preliminary Data Analysis of Likert-scale Items

Descriptive statistics. The descriptive statistics for all the Likert-scale questions in the students' HLP questionnaire are shown in Table IV-11.

Table IV-11

Descriptive Statistics for the Likert-scale Questions of Students' HLP Questionnaire

				NK (n = 191)				SK (n = 154)			
Question				*M*	*SD*	*Min*	*Max*	*M*	*SD*	*Min*	*Max*
Reading Practices	Book reading		a	2.04	.83	1	5	2.25	1.18	1	5
			b	2.03	1.04	1	5	2.56	1.25	1	5
	Number of Books			2.26	.94	1	5	3.71	1.23	1	5
	Library visits		a	1.65	.89	1	5	2.06	1.08	1	5
			b	1.48	.80	1	5	2.11	1.16	1	5
	Library books		a	1.53	.80	1	5	1.94	1.09	1	5
			b	1.43	.76	1	5	2.06	1.29	1	5
	Bookstore visits		a	1.72	.98	1	5	1.83	.90	1	5
			b	1.55	.92	1	5	1.86	.91	1	5
	e-Bookstore visits		a	1.31	.81	1	5	1.32	.74	1	5
			b	1.27	.75	1	5	1.36	.77	1	5
	Magazine reading		a	1.26	.49	1	4	1.45	.84	1	5
			b	1.21	.52	1	5	1.49	.94	1	5
	Newspaper reading		a	1.07	.26	1	2	1.32	.62	1	4
			b	1.09	.36	1	3	1.27	.63	1	4
	Digital text reading		a	2.49	1.28	1	5	3.07	1.42	1	5
			b	2.90	1.57	1	5	3.26	1.51	1	5
Academic Interest/Support	Interest reading	Parent		1.77	.95	1	5	2.83	1.44	1	5
	Conversion reading	Parent		1.48	.89	1	5	2.18	1.28	1	5
		Friend		1.53	.89	1	5	1.89	1.18	1	5
		Other		1.63	1.19	1	5	2.66	1.59	1	5
	Homework help			1.84	1.17	1	5	2.11	1.31	1	5
	Conversion school	Activity		2.62	1.32	1	5	3.19	1.43	1	5
		Learning		2.13	1.23	1	5	3.17	1.46	1	5
		Progress		2.21	1.31	1	5	2.87	1.30	1	5
		Strategy		1.92	1.20	1	5	2.64	1.34	1	5
Digital Device Access/Use	Internet time		a	2.95	1.45	1	5	3.25	1.43	1	5
			b	3.28	1.56	1	5	3.60	1.49	1	5
	e-Program use		a	1.35	.67	1	4	1.67	1.03	1	5

Table IV-11 Continued

Question				NK (n = 194)				SK (n = 151)			
				M	*SD*	*Min*	*Max*	*M*	*SD*	*Min*	*Max*
			b	1.29	.61	1	4	1.66	1.07	1	5
	Screen time		a	3.85	1.42	1	5	3.83	1.24	1	5
			b	3.77	1.52	1	5	3.85	1.41	1	5
	Screen time limit		a	2.04	1.35	1	5	2.57	1.48	1	5
			b	1.90	1.24	1	5	2.68	1.59	1	5
	Number of digital devices			1.24	.92			1.93	1.17		
	Number of online programs			.89	1.72			1.65	2.62		
After-school Learning	Academic subject	Hagwon	a	1.12	.48	1	4	1.90	1.03	1	5
			b	1.13	.50	1	4	1.95	.98	1	5
		Tutor	a	1.02	.12	1	2	1.26	.75	1	5
			b	1.02	.14	1	2	1.36	.80	1	5
		Children's	a	2.23	1.85	1	5	1.05	.38	1	5
		center	b	2.24	1.85	1	5	1.04	.34	1	5
		Mentoring	a	1.11	.44	1	5	1.07	.40	1	5
			b	1.11	.44	1	5	1.06	.39	1	5
	Number of subjects-Hagwon			.42	1.55			3.36	3.34		
	Number of subjects-Tutoring			.11	.40			.92	1.85		
	Number subjects-Children's center			3.08	4.60			.08	.56		
	Number of subjects-Mentoring			3.08	4.60			.08	.56		
	Nonacademic activity	Hagwon	a	1.03	.23	1	3	1.26	.78	1	5
			b	1.02	.29	1	5	1.33	.88	1	5
		Tutor	a	1.00	.00	1	1	1.04	.26	1	3
			b	1.00	.00	1	1	1.03	.21	1	3
	Number of activities in Hagwon			.14	.49			.56	1.01		
	Number of activities in Tutoring			.00	.00			.15	.57		
Age				4.78	2.13	1	6	5.15	1.91	1	7

Note. a=during the school year; b=during vacations.

Principal component analyses. Similar to the analyses conducted on the parent survey, we performed principle component analyses (PCA) with oblimin rotation on the student survey results to reduce the number of variables.

Reading practice. The results of PCA of the questions about reading practice for the students are shown in Table IV-12.

Table IV-12

Results of Principal Component Analysis of Reading Practices of Students' HLP Questionnaire

		Factor					
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Cronbach's
		Library Visits	Digital Text Reading	Bookstore Visits	Magazine Newspaper Reading	Interest in Books	α
Library visits	a	.86					.86
	b	.76					
Library books	a	.80					
	b	.79					
Digital text	a		.90				.80
	b		.90				
e-Bookstore	a			-.88			.81
	b			-.81			
Bookstore	a			-.66			
	b			-.68			
Magazine	a				.80		.80
	b				.78		
Newspapers	a				.84		
	b				.78		
Book reading	a					.87	.69
	b					.76	
Books						.55	
KMO (Kaiser Meyer Olkin)							.77
Bartlett Test of Sphericity						Chisquare	2852.77
						df (*p*)	136 (.000)

Note. a=during the school year; b=during vacations.

The analysis yielded five factors explaining a total of 69.3% of the variance. Factor 1 was labeled *Library Visits* due to high loadings from four items related to library: library visits

and library books borrowed. Factor 2 was labeled *Digital Text Reading* due to high loadings from two items related to digital texts: digital text reading during the school years and vacations. Factor 3 was labeled *Bookstore Visits* due to high loadings from four items related to bookstores: local and online bookstore visits during the school year and vacations. Factor 4 was labeled *Magazine & Newspapers Reading* due to high loadings from four items related to magazine and newspapers reading during the school year and vacations. Factor 5 was labeled *Interest in Books* due to high loadings from three items related to books: the number of hours of book reading at home during the school year and vacations, and the number of students' books in their home. The five factors explained 31.7%, 10.6%, 10.2%, 10.1%, and 6.6% of the variance, respectively, and internal consistency (Cronbach's α) was .86, .80, .81, .80, and .69, respectively.

The correlations between the five reading practice factors are displayed in Table IV-13.

Table IV-13

Correlations among Factors on the Reading Practices for the Students

Component	1	2	3	4	5
1. Library visits	–				
2. Digital text reading	.01	–			
3. Bookstore visits	-.30	.02	–		
4. Magazine & newspapers reading	.34	.02	-.26	–	
5. Interest in books	.39	.03	-.21	.29	–

There were negative correlations among factors, for example, between *Library visits* and *Bookstore visits*, between *Magazine & Newspapers reading* and *Bookstore visits*, and between *Interest in Books* and *Bookstore visits* (-.30, -.26, and -.21, respectively). It should be noted that these negative correlations among factors were caused by the negative value of the bookstore visits. This can be explained by the mixture of effects of social atmosphere and education system in SK where the focus is overly weighted toward college entrance exams, and the cultural model of reading habits in South Korea.

Academic interest and support. The results of PCA of the questions about academic interest and support are shown in Table IV-14.

Table IV-14

Results of Principal Component Analysis of Academic Interest/Support of Students' HLP Questionnaire

	Factor		
	Factor 1 Interest Schoolwork	Factor 2 Interest Reading	Cronbach's α
Talking about school activities	.66		
Talking about school learning	.72		
Talking about academic progress	.92		.80
Talking about academic strategies	.81		
Discussion reading with friends		.84	
Discussion reading with parents		.86	.74
Discussion reading with others		.61	
Parents' interest in reading		.57	
KMO (Kaiser Meyer Olkin)			.79
Bartlett Test of Sphericity		Chi-square	940.402
		df (*p*)	28(.000)

Communalities for the question on *Homework help* were low (.29), and the question was removed and analyzed separately. After removal, the analysis yielded two factors explaining a total of 61.2% of the variance for the eight variables. Factor 1 was labeled *Interest in Schoolwork* due to high loadings from four items related to school: talking about academic progress, academic strategies, learning in school, and school activities. The first factor explained 44.3% of the variance and Cronbach's α was .80. Factor 2 was labeled *Interest in Reading* due to high loadings from four items related to reading interest: the parents' interest in their children's reading, discussion with parents of what the student read, discussion with friends of what the student read, and discussion with others of what the student read. The variance explained by the second factor was 16.9 %, and Cronbach's α was .74. The correlation

between *Interest in Schoolwork* and *Interest in Reading* was .39.

Digital device access and use. The results of PCA of the questions about digital device access and use are shown in Table IV-15.

Table IV-15

Results of Principal Component Analysis of Digital Device Access and Use

		Factor			Cronbach's
		Factor 1	Factor 2	Factor 3	
		Online Education Activity	Internet/ Screen Time	Screen-time Limit	α
Hours of online educational program	a	.93			.78
	b	.93			
Number of educational programs		.90			
Hours of internet use	a		.85		.83
	b		.82		
Hours of screen use	a		.79		
	b		.79		
Screen-time limit	a			-.95	.90
	b			-.96	
KMO (Kaiser Meyer Olkin)					.67
Bartlett Test of Sphericity				Chi-square	1825.86
				df (*p*)	36(.000)

Two composite-scale questions of *Number of online educational program* used during the school year and vacations and *Number of digital devices* were part of the factor analysis; however, the communalities of the question about the *Number of digital devices* were low (.27), and the question was removed and analyzed separately. After removal, the analysis yielded three factors explaining a total of 78.1% of the variance for the nine variables. Factor 1 was labeled *Online educational activity* due to high loadings from three items related to online educational resource use: the number of hours per day the students utilized online educational resources during the school year and vacations, and the number of online educational programs they used.

The first factor explained 33.5% of the variance and Cronbach's α was .78.

Factor 2 was labeled *Internet /Screen time* due to high loadings from four items related to time spent on the internet or on other screen devices (e.g., game player and TV): the number of hours per day the students spent on the internet during the school year and vacations, and the number of hours per day the students spent in front of a screen. The variance explained by the second factor was 28.9 %, and Cronbach's α was .83. Factor 3 was labeled *Screen-time limit* due to high loadings from two items related to the limit of students' total screen time: the number of hours per day the students' parent(s)/guardian(s) limited their total screen time during the school year and vacations. The variance explained by the third factor was 15.8 %, and Cronbach's α was .90.

Correlations among factors were small and negative. Online educational activity and Screen-time limit -.25; Internet/Screen time and Screen-time limit .17; and Online educational activity and Internet/Screen time .02.

After-school learning activities.

Academic subjects. Because the internal consistency coefficient of the dimension of the Academic subjects was not acceptable (Cronbach's $\alpha = .40$; >. 60 acceptable as a rough guide), it was not appropriate to include all the items in a composite scale. Instead, each item was examined individually. There were twelve items analyzed, including eight Likert-scale items about how many hours per day the student spent in the Hagwons, one-to-one tutoring, Children's center, and mentoring during the school year and vacations and four composite-scale items about Number of (academic) subjects in Hagwons, Number of subjects in tutoring, Number of subjects in Children's center, and Number of subjects in mentoring.

Non-academic activities. The result of PCA of the questions about after-school learning

activities for non-academic activities are shown in Table IV-16.

Table IV-16

Results of Principal Component Analysis of Non-academic Activities

		Factor 1	Factor 2	Cronbach's
		Nonacademic Hagwon	Nonacademic Tutoring	*α*
Hagwon	a	.90		.82
	b	.91		
Number of activities in Hagwon		.80		
Tutoring	a		.96	.90
	b		.96	
KMO (Kaiser Meyer Olkin)				.64
Bartlett Test of Sphericity			Chi-square	914.76
			df (*p*)	10 (.000)

Note. a=during the school year; b=during vacations.

The composite-scale question of *Number of activities in Hagwons* was included in the factor analysis*;* as there was no student from NK who responded 'yes' to the question about *Number of activities in tutoring,* the item was removed. After removal, the analysis yielded two factors explaining a total of 82.3% of the variance for the six variables. Factor 1 was labeled *Non-academic Hagwon* due to high loadings from three items related to private Hagwons for non-academic activities: the number of hours spent in Hagwons during the school year and vacations, and the number of activities in the Hagwons. The first factor explained 52.9% of the variance and Cronbach's *α* was .82.

Factor 2 was labeled *Non-academic tutoring* due to high loadings from two items related the private one-to-one tutoring for non-academic activities: the number of hours attending private tutoring during the school year and vacations. The second factor explained 29.4% of the variance and Cronbach's *α* was .90. The correlation between the two factors was .26.

Group Comparison

The results of a series of ANCOVAs after controlling for age are shown in Table IV-17.

Table IV-17

Results of ANCOVAs for the Effect of Group on Each Factor of Students' HLP Questionnaire

		NK (*n* = 194)		*SK* (*n* = 151)			
		M	*SD*	*M*	*SD*	*F* (1, 342)	η_p^2
Reading Practices							
Library visits		-.29	.79	.37	1.12	41.60***	.11
Digital text reading		-.21	.92	.27	1.04	17.34***	.05
Bookstore visits		.01	1.03	-.02	.97	.03	.00
Magazine & newspapers reading		-.22	.64	.28	1.27	22.89***	.06
Interest in books		-.28	.78	.36	1.13	41.22***	.11
Academic Interest & Support							
Interest in schoolwork		-.31	.82	.40	1.07	47.55***	.12
Interest in reading		-.33	.77	.43	1.09	57.29***	.14
Homework help		1.84	1.17	2.11	1.31	5.14*	.01
Digital Device Access & Use							
Online educational Program		-.18	.76	.24	1.21	13.77***	.04
Internet/Screen Time		-.06	1.02	.08	.98	.96	.00
Screen-time Limit		.21	.89	-.26	1.07	17.99***	.05
Number of digital devices		1.24	.92	1.93	1.17	34.56***	.09
Academic Subjects							
Hagwons	a	1.12	.48	1.90	1.03	84.03***	.20
	b	1.13	.50	1.95	.98	98.49***	.22
Tutoring	a	1.02	.12	1.26	.75	18.97***	.05
	b	1.02	.14	1.36	.80	32.44***	.09
Children's center	a	2.23	1.85	1.05	.38	60.32***	.15
	b	2.24	1.85	1.04	.34	62.39***	.15
Mentoring	a	1.11	.44	1.07	.40	.75	.00
	b	1.11	.44	1.06	.39	1.14	.00
Number of subjects-Hagwons		.42	1.55	3.36	3.34	114.95***	.25
Number of subjects-tutoring		.11	.40	.92	1.85	34.28***	.09
Number subjects-Children's center		3.08	4.60	.08	.56	64.05***	.16
Number of subjects-mentoring		3.08	4.60	.08	.56	64.05***	.16
Non-academic Activities							
Non-academic Hagwons		-.24	.43	.26	1.28	25.86***	.07
Non-academic tutoring		-.11	.01	.16	1.40	4.78*	.01
Number of activities in Hagwons		.14	.49	.18	.63	25.72***	.07

Note. Age was controlled.
*$p < .05$, ** $p < .01$, *** $p < .001$.

The ANCOVAs indicate that the South Korean students reported more frequent library visits, digital text and magazine/newspapers reading, more access to books, more parents' supports for their school works, more frequent conversations about their reading with their parents, friends, and other people, more parents' help with homework, more time spent on using educational resource use, shorter screen-time limits, and more digital devices.

Likewise, Table IV-17 indicates that while the South Korean students reported more attendance of Hagwons and receiving more one-to-one tutoring, the North Korean students reported more attendance of free programs provided by the local community Children's center for academic subjects during the school year and vacations. Additionally, the South Korean students reported more attendance of Hagwons and receiving one-to-one tutoring for non-academic activities, and more activities involved in the Hagwons. However, there were no significant differences in Bookstore visits, total internet/screen time, and Mentoring during the school year and vacations.

These results of after-school learning activities are in line with several previous studies on pervasive private education and high spending on private education in SK (e.g., Choi & Baek, 2017; Kim, 2007; Moon & Kim, 2003; Statistics Korea, 2018).

Descriptive Statistics for Dichotomous Items.

Table IV-18 shows the descriptive statistics for the dichotomous scales of the students' HLP questionnaire.

Table IV-18

Descriptive statistics of Dichotomous Questions of Students' HLP Questionnaire

		NK (N = 194)		SK (N = 151)		
Dichotomous Item		N	%	N	%	X^2 (1, 345)
Library card ownership		34	27.6	59	48.0	10.81***
Digital device ownership		103	83.7	111	90.2	2.30
Home internet access		111	90.2	119	96.7	4.28*
Educational program	a	36	29.3	45	36.6	1.49
	b	31	25.2	41	33.3	1.96
Academic subject						
Hagwons	a	15	12.2	64	52.0	44.77***
	b	19	15.4	73	59.3	50.63***
Tutoring	a	7	5.7	29	23.6	15.75***
	b	9	7.3	32	26.0	15.48***
Children's center	a	32	26.0	3	2.4	28.01***
	b	32	26.0	3	2.4	28.01***
Mentoring	a	12	9.8	9	7.3	.47
	b	12	9.8	7	5.7	1.43
Non-academic activities						
Hagwons	a	11	8.9	34	27.6	14.39***
	b	8	6.5	35	28.5	20.55***
Tutoring	a	0	0	10	8.1	10.42**
	b	0	0	9	7.3	9.34**

Note. a=during the school year; b=during vacations.
*p < .05, ** p < .01, *** p < .001.

The chi-square tests indicate that more South Korean students reported (a) owning a library card, (b) having home internet access (c) attendance in private Hagwons for academic subjects during the school year and vacations, (d) receiving one-to-one tutoring for academic subjects during the school year and vacations, (e) attendance of private Hagwons for non-academic activities during the school year and vacations, and (f) receiving one-to-one tutoring in non-academic activities during the school year and vacations. By contrast, more North Korean students reported attending Children's center for academic subjects during the school year and vacations. No significant differences were found in digital device ownership, whether students used online educational resources during the school year and vacations, and whether

they received mentoring programs. Again, these results for after-school learning activities are consistent with previous studies on South Korea's private education problems (the pervasiveness of private tutoring and high spending on it) (e.g., Choi & Baek, 2017; Kim, 2007; Moon & Kim, 2003; Statistics Korea, 2018).

Q3.2. Do those differences in the students' HLP reflect SES?

The results of a series of ANCOVAs after controlling age and SES are shown in Table IV-19 for the subsample of students whose SES data was available.

The ANCOVAs indicate that the observed differences in a number of areas are largely explained by SES. This includes (a) Digital text reading, (b) Interest in schoolwork, (c) Homework help, (d) Online educational program use, (e) Screen-time limits, (f) number of digital devices, (g) hours per day in Hagwons for academic subjects during the school year and vacations, (h) hours per day in tutoring for academic subjects during the school year and vacations, (i) the number of subjects studied in Hagwons, (j) the number of subjects studied in tutoring, (k) hours per day in Hagwons for non-academic activities, (l) hours per day in tutoring for non-academic activities, (m) the number of non-academic activities involved in Hagwons, and (n) the number of non-academic activities involved in tutoring.

By contrast, there were significant differences between the two groups of students in seven areas, even after controlling for SES: (a) Library visits, (b) magazine/newspapers reading, (c) interest in books, (d) parents' interest in their children's reading, (e) hours per day in Children's center during the school year, (f) hours per day in Children's center during vacations, and (g) the number of academic subjects studied in the Children's center. While the South Korean students reported more library visits, more magazine/newspapers reading, more interest in books, more parental interest in their reading, the North Korean students reported more time

in local children's community center for their academic subjects after school.

Table IV-19

Results of ANCOVAs for the Effect of Group on Each Factor of Students' HLP Questionnaire

		NK (n = 101)		SK (n = 62)			
		M	SD	M	SD	F (1, 159)	η_p^2
Reading Practices							
Library visits		-.43	.59	.46	1.20	13.87***	.08
Digital text reading		-.10	.95	-.35	.99	.93	.01
Magazine & newspapers reading		-.27	.63	.26	1.28	4.62*	.03
Bookstore visits		.04	.91	.00	1.00	.03	.00
Interest in books		-.38	.69	.59	1.19	19.88***	.11
Academic Interest & Support							
Interest in schoolwork		-.37	.75	.23	1.08	3.38	.02
Interest in reading		-.43	.67	.43	1.12	14.73***	.09
Homework help		2.04	1.33	2.56	1.39	1.04	.01
Digital Device Access & Use							
Online educational Program		-.23	.74	-.15	.88	2.83	.02
Internet/Screen Time		.02	.99	-.24	1.05	1.78	.01
Screen-time Limit		.22	.90	.03	.97	.30	.00
Number of digital devices		1.37	1.00	1.58	1.17	.55	.00
Academic Subjects							
Hagwons	a	1.07	.32	1.37	.68	.59	.00
	b	1.10	.41	1.52	.74	.54	.00
Tutoring	a	1.02	.14	1.31	.90	2.42	.02
	b	1.02	.14	1.31	.82	1.48	.01
Children's center	a	1.90	1.67	1.03	.25	4.56*	.03
	b	1.91	1.69	1.02	.13	4.36*	.03
Mentoring	a	1.14	.53	1.11	.58	.48	.00
	b	1.14	.53	1.11	.58	.43	.00
Number of subjects-Hagwons		.64	2.01	2.00	2.76	.15	.00
Number of subjects-tutoring		.11	.40	1.08	2.28	3.50	.02
Number subjects-Children's center		3.04	4.58	.06	.51	20.92***	.12
Number of subjects-mentoring		.49	1.59	.24	1.04	1.92	.01
Non-academic Activities							
Non-academic tutoring		-.16	.02	.03	.85	.10	.00
Non-academic Hagwons		-.25	.51	.08	.92	.01	.00
Number of activities in tutoring		.00	.00	.16	.00	.78	.01
Number of activities in Hagwons		.15	.50	.63	.15	.24	.00

Note. Age and SES were controlled. a=during the school year; b=during vacations.
*p < .05, ** p < .01, *** p < .001.

For the dichotomous questions, we wanted first to control SES and age in the same way

as mentioned above. After controlling for age and SES, Chi-square tests showed that there were no significant differences between the groups on any of the dichotomous items. Our results indicate that the observed differences between the two groups in the dichotomous questions of the students' HLP questionnaire can be explained by SES.

Q4. How do SES and HLP variables predict academic achievement? Are the relationships between academic achievement, SES, and HLP different across the two groups?

Parents' HLP Questionnaire

To examine the two research questions above, correlation, partial correlation, and hierarchical multiple regression analyses were conducted combining continuous (Likert scale) and one dichotomous variable (screen-time limit). Dichotomous questions about library card ownership and online educational resources were not included as they are covered in the Parents' HLP questionnaires.

Hierarchical Multiple Regression Analysis

The correlations among all academic achievement variables and Parents' HLP questionnaire variables are shown in Table IV-20. Next, the partial correlations among variables controlling for age and SES are shown in Table IV-21.

Table IV-20

Correlations among All Academic Achievement Variables and Parents' HLP Variables in NK (below diagonal) and SK (above diagonal) Parents

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Investment in books		.28**	.33**	.30**	.25**	.41**	.08	.35**	.08	.22**	.10	-.04	-.15	-.06	.02	-.11	-.09	.27**	.01
2. Library/Bookstore visit	.28**		.20*	.21*	.22**	.08	.12	.30**	.06	.09	.21**	.09	.09	.03	.04	.06	.05	.07	.26*
3. Reading	.46**	.48**		.33**	.39**	.05	-.15	.53**	.16	.34**	.15	.16	.17*	.10	.13	.12	.16	-.09	.05
4. Digital text reading	-.07	-.09	.30**		.16*	.36**	.11	.34**	.00	.21*	-.09	-.05	-.05	-.03	-.04	-.01	-.03	.04	.07
5. Academic interest/support	.24*	.17	.55**	.17		.16	.17*	.40**	.20*	.37**	.14	.14	.01	.05	.09	.07	.16	.02	.19
6. Parents' internet time	-.08	.02	.07	.16	.14		.46**	.09	.23**	-.04	-.01	-.15	-.11	-.14	-.02	-.14	-.07	.24**	-.09
7. Students' internet time	.08	.05	.30**	-.03	.29**	-.13		-.03	-.02	-.08	.03	.03	-.10	-.01	.14	-.01	.00	.18*	.28*
8. e-Program	.37**	.25**	.53**	.34**	.51**	.08	.29**		-.08	.70**	.15	.31**	.22**	.25**	.32**	.22**	.25**	-.15	.26*
9. No. digital device	.40**	.33**	.68**	.06	.64**	.14	.39**	.63**		.11	.03	.01	.08	-.04	.05	-.02	.05	-.15	.11
10. No. e-Program	.56**	.43**	.73**	.33**	.52**	-.01	.28**	.88**	.70**		.15	.23**	.19*	.18*	.20*	.16*	.18*	-.30**	.25
11. Screen-time limit	.32**	.16	.16	-.19	.17	.08	.14	.11	.43**	.10		.20*	.21*	.08	.06	.18*	.05	-.27**	.19
12. GPA	-.03	.10	-.06	-.02	-.04	.00	-.10	-.03	.01	-.04	.08		.80**	.82**	.75**	.85**	.80**	-.37**	.58**
13. Korean	.02	.08	.03	.01	.09	-.02	-.03	.03	.13	.03	.05	.83**		.71**	.64**	.74**	.71**	-.36**	.36**
14. Math	-.02	.05	-.06	-.01	-.09	-.04	-.12	-.07	-.01	-.09	.07	.82**	.83**		.66**	.75**	.66**	-.34**	.45**
15. English	-.02	.12	.02	.01	-.03	.04	-.03	-.01	.07	-.01	.11	.77**	.69**	.70**		.57**	.61**	-.18*	.41**
16. Science	.07	.16	.06	-.05	.12	.02	.05	.06	.15	.07	.05	.82**	.76**	.69**	.67**		.76**	-.42**	.51**
17. Social Studies	.01	.07	-.01	-.06	.06	.01	.04	.10	.11	.05	.03	.86**	.78**	.71**	.68**	.88**		-.32**	.35**
18. Age	.02	.04	.18	.06	.19	.07	.20*	.14	.16	.19*	.03	-.07	-.04	-.17	.01	-.04	-.08		-.09
19. SES [a]	-.07	-.15	-.26**	-.04	-.19	.04	-.04	.03	-.13	-.25*	.22*	.27**	.26**	.32**	.40**	.27**	.22*	.04	

Note. e-Program=Online educational program. No. digital device=The number of digital devices. No. e-Program=The number of online educational programs.

[a] $N = 101$ for NK and $N = 62$ for SK.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table IV-21

Partial Correlations among Measures Controlling for Age and SES in the NK (below diagonal) and SK (above diagonal) Parents

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Investment in books		-.35**	.51**	.53**	.55**	.39**	-.11	.25	.57**	.53**	.20	-.06	.09	-.07	-.09	-.07	-.04
2. Library/Bookstore visit	.86**		-.20	.09	-.05	-.01	.22	-.21	.26*	-.38**	.04	-.10	.09	-.08	-.06	-.04	-.03
3. Reading	.68**	.74**		.54**	.58**	.26*	-.09	.56**	.28*	.24	.00	.07	.05	-.01	.13	-.04	.12
4. Digital text reading	-.08	-.06	.13		.53**	.61**	.15	.30*	.50**	.37**	-.03	-.26*	-.09	-.34**	-.14	-.21	-.12
5. Academic interest/support	.64**	.65**	.54**	-.02		.10	.08	.45**	.43**	.39**	.00	.11	-.01	-.06	.17	-.07	.09
6. Parents' internet time	-.18	-.18	-.22*	.16	-.19		.25	.00	.43**	.19	.10	-.41**	-.05	-.37**	-.29*	-.36**	-.20
7. Students' internet time	.05	.00	.04	-.04	.05	-.14		-.05	.08	.07	.08	-.08	-.06	-.06	.11	-.10	-.10
8. e-Educational program	.19	.11	.20*	.33**	.24*	.07	.27**		-.05	.67**	.17	.32*	.15	.20	.39**	.05	.20
9. No. digital device	.23*	.22*	.37**	-.08	.53**	.01	.10	.24*		.14	.13	-.24	.04	-.13	-.16	-.19	-.12
10. No. e-Program	.41**	.49**	.72**	.09	.45**	-.23*	.06	.27**	.36**		.17	.19	.16	.13	.26*	.02	.11
11. Screen-time limit	-.04	.01	-.01	-.19	.15	.07	.15	.10	.22*	-.05		-.07	.10	-.12	-.17	-.24	-.21
12. GPA	-.02	.02	.00	-.01	.09	-.01	-.07	-.03	.25*	.12	.02		.62**	.73**	.75**	.72**	.73**
13. Korean	.06	.08	.16	.03	.14	-.03	.00	.03	.36**	.16	-.02	.82**		.54**	.55**	.37**	.59**
14. Math	-.01	.03	.05	.02	.07	-.04	-.08	-.06	.20*	.11	.00	.80**	.83**		.57**	.61**	.47**
15. English	-.03	-.01	-.01	.03	-.03	.02	-.02	-.03	.20*	-.02	.01	.75**	.66**	.67**		.46**	.60**
16. Science	.01	.00	.01	-.04	-.02	.02	.10	.06	.21*	.10	-.01	.82**	.75**	.67**	.65**		.52**
17. Social Studies	.10	.10	.05	-.05	.11	.01	.09	.10	.26**	.16	-.02	.86**	.77**	.70**	.67**	.87**	

Note. e-Program=Online educational program. No. digital device=The number of digital devices. No. e-Program=The number of online educational programs.
* $p < .05$, ** $p < .01$, *** $p < .001$.

None of the HLP variables were significantly associated with academic achievement for the North Korean students; however, Reading (books, magazine, and newspapers), hours per day students spent using online educational programs, the number of online educational programs they used, and whether the parents limited their children's screen-time were significant for the South Korean students when age and SES were not controlled. When age and SES were controlled, number of digital devices at home was positively associated with academic achievement for NK students and explained 4 to 13% of variance in academic achievement measures. The amount of digital text reading (negative for GPA and Math), the amount of parents' internet time (negative for GPA, Math, English, and Science), hours per day students spent using online educational programs (positive for GPA and English), and the number of online educational programs students used (positively for English) were associated with academic achievement for the South Korean students. For the North Korean students, as only one variable correlated significantly with the academic outcome measures, no further analyses were conducted. For the South Korean students, Korean and Social Studies were not associated significantly with any of the HLP variables, and Science was associated only with parents' internet time that explained 13% of the variance after age and SES were controlled. No further analyses were conducted for these three academic outcome measures.

The results of the hierarchical multiple regression analysis for GPA, Math, and English of the SK students are shown in Table IV-22.

Table IV-22

Results of Hierarchical Multiple Regression Analysis for the South Korean Parents

		GPA			Math			English		
Step	Predictors	ΔR^2	*B*	*SE*	ΔR^2	*B*	*SE*	ΔR^2	*B*	*SE*
1	Age	.00	-.05	.10	.00	-.02	.10	.01	.11	.12
2	SES	.33	.75	.14	.20	.60	.16	.18	.65	.18
3	Digital text reading	.20	-.16	.13	.13	-.16	.14	.20	-	-
	Parents' internet time		-.20*	.10		-.19	.11		-.27*	.10
	e-Program		.22**	.07		-	-		.23	.12
	No. e-Program		-	-		-	-		.08	.12
	Total R^2	.53			.33			.39		

Note. e-Program=Online educational program; No. e-Program=The number of online educational programs.
* $p < .05$, ** $p < .01$, *** $p < .001$.

SES (33%) and the three included home literacy environment variables (digital text reading, parents' internet time, and hours per day students use online educational programs; 20%) jointly accounted for 53% of variance in GPA. When the HLE variables were entered in stage three of the regression model, digital text reading did not predict unique variance in GPA, but parents' internet time was a significant negative predictor, and hours per day students spent using online educational programs was a significant positive predictor of GPA.

SES (20%) and the two included HLE variables (digital text reading and parents' internet time, 13%) jointly accounted for 33% of variance in Math. When the HLE variables were entered in stage three of the regression model, neither predicted unique variance in Math. Finally, age (1%), SES (18%), and the three included HLE variables (parents' internet time, hours per day students spent using online educational programs, and the number of online educational programs the students used; 20%) jointly accounted for 39% of variance in English. When the HLE variables were entered in stage three of the regression model, only parents' internet time explained unique variance in English.

Students' HLP Questionnaire

The students' survey was divided into four parts: (1) reading practice, (2) reading interest and support, (3) digital device access and use, and (4) after-school learning. The items on the first three parts of the Students' HLP questionnaire were not included as they were covered in the Parents' HLP questionnaire and by the analyses reported above.

To examine whether attending after-school learning activities (Hagwons, Children's center, tutoring, and mentoring) was beneficial, we first compared within NK and SK groups the performance of those who attended a specific after-school learning activity to those who did not. As very few South Korean students attended Children's center and mentoring, only Hagwons and tutoring attendance were analyzed for the South Korean students. Table IV-23, 24, 25, 26, 27, and 28 shows the number of students, means, and standard deviations for each group.

Table IV-23
Descriptive statistics of After-school Learning Activities for GPA

		GPA [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	1.83	.93	8	2.00	.92	42	3.02	.90	20	3.85	.99
	b	90	2.18	.93	11	2.27	.91	34	2.88	.95	28	3.79	.83
Tutoring	a	93	2.16	.92	8	2.50	.93	46	3.33	1.01	16	3.19	.98
	b	93	2.16	.92	8	2.50	.93	47	3.21	1.04	15	3.53	.83
Children's center	a	78	2.29	.96	23	1.83	.72	61	3.26	.98	1	5.00	–
	b	78	2.31	.94	23	1.78	.74	61	3.26	.98	1	5.00	–
Mentoring	a	92	2.20	.92	9	2.11	1.05	59	3.31	.97	3	3.00	1.73
	b	92	2.18	.93	9	2.22	.97	58	3.29	.97	4	3.25	1.50

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

Table IV-24
Descriptive statistics of After-school Learning Activities for Korean

		Korean [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	2.28	1.09	8	2.75	.71	42	3.01	.93	20	3.75	.72
	b	90	2.28	1.08	11	2.64	.92	34	3.09	.90	28	3.75	.75
Tutoring	a	93	2.28	1.05	8	2.75	1.28	46	3.37	.90	16	3.44	.89
	b	93	2.28	1.05	8	2.75	1.28	47	3.30	.91	15	3.67	.82
Children's center	a	78	2.47	1.07	23	1.78	.90	61	3.36	.88	1	5.00	–
	b	78	2.49	1.07	23	1.74	.86	61	3.36	.88	1	5.00	–
Mentoring	a	92	2.30	1.06	9	2.44	1.24	59	3.39	.89	3	3.33	1.16
	b	92	2.29	1.05	9	2.56	1.24	58	3.38	.90	4	3.50	1.00

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

Table IV-25
Descriptive statistics of After-school Learning Activities for Math

		Math [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	2.25	1.04	8	2.13	1.13	42	3.21	1.00	20	3.80	.95
	b	90	2.27	1.04	11	2.00	1.10	34	3.12	1.09	28	3.75	.80
Tutoring	a	93	2.23	1.04	8	2.38	1.06	46	3.41	1.02	16	3.38	1.03
	b	93	2.23	1.04	8	2.38	1.06	47	3.32	1.05	15	3.67	.90
Children's center	a	78	2.33	1.07	23	1.91	.90	61	3.38	1.00	1	5	–
	b	78	2.35	1.06	23	1.87	.92	61	3.38	1.00	1	5	–
Mentoring	a	92	2.26	1.04	9	2.00	1.12	59	3.42	.99	3	3.00	1.73
	b	92	2.25	1.04	9	2.11	1.05	58	3.41	.99	4	3.25	1.50

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

Table IV-26
Descriptive statistics of After-school Learning Activities for English

		English [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	1.83	.93	8	2.00	1.20	42	2.86	1.12	20	3.80	1.06
	b	90	1.82	.93	11	2.00	1.10	34	2.65	1.13	28	3.79	.92
Tutoring	a	93	1.83	.94	8	2.00	1.07	46	3.17	1.16	16	3.13	.16
	b	93	1.84	.95	8	1.88	.99	47	3.04	1.14	15	3.53	1.25
Children's center	a	78	1.97	.97	23	1.39	.72	61	3.13	1.15	1	5.00	–
	b	78	1.97	.97	23	1.39	.72	61	3.13	1.16	1	5.00	–
Mentoring	a	92	1.87	.94	9	1.56	1.01	59	3.19	1.17	3	2.67	1.53
	b	92	1.86	.94	9	1.67	1.00	58	3.19	1.17	4	2.75	1.26

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

Table IV-27
Descriptive statistics of After-school Learning Activities for Science

		Science [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	2.15	.82	8	2.25	.46	42	3.24	.88	20	3.95	.83
	b	90	2.13	.82	11	2.36	.51	34	3.18	.90	28	3.82	.82
Tutoring	a	93	2.13	.78	8	2.50	.93	46	3.48	.96	16	3.44	.81
	b	93	2.12	.79	8	2.63	.74	47	3.43	.97	15	3.60	.74
Children's center	a	78	2.22	.80	23	1.96	.79	61	3.44	.90	1	5.00	–
	b	78	2.23	.81	23	1.91	.73	61	3.44	.90	1	5.00	–
Mentoring	a	92	2.12	.80	9	2.56	.73	59	3.47	.92	3	3.33	1.16
	b	92	2.11	.79	9	2.67	.71	58	3.47	.92	4	3.50	1.00

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

Table IV-28
Descriptive statistics of After-school Learning Activities for Social Studies

		Social studies [c]											
		NK (*N* = 101)						SK (*N* = 62)					
		No			Yes			No			Yes		
		N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Hagwon	a	93	2.16	.84	8	2.13	.64	42	3.31	.81	20	3.65	1.04
	b	90	2.14	.84	11	2.27	.65	34	3.12	.77	28	3.79	.92
Tutoring	a	93	2.13	.81	8	2.50	.93	46	3.48	.94	16	3.25	.78
	b	93	2.12	.82	8	2.63	.74	47	3.36	.90	15	3.60	.91
Children's center	a	78	2.23	.82	23	1.91	.79	61	3.41	.90	1	4.00	–
	b	78	2.26	.81	23	1.83	.78	61	3.41	.90	1	4.00	–
Mentoring	a	92	2.14	.81	9	2.33	1.00	59	3.44	.86	3	3.00	1.73
	b	92	2.12	.81	9	2.56	.88	58	3.43	.86	4	3.25	1.50

Note. a=during the school year; b=during vacations. [c] The scale points were: (1) poor, (2) fair, (3) good, (4) very good, (5) excellent.

In general, the means in Tables IV-23 to IV-28 indicate that attending Hagwons and tutoring was mostly associated with better performance and, for the North Korean students, attending Children's center was not, with mentoring showing mixed results. For the North Korean students, ANCOVAs controlling for age and SES showed that only the differences for the attendance in Children's center for academic subjects during the school year was significant for GPA, F (1, 97) = 4.14, p = .045, η_p^2 = .04, Korean, F (1, 97) = 7.80, p = .006, η_p^2 = .07, and English, F (1, 97) = 8.16, p = .005, η_p^2 = .08. Similarly, the attendance in Children's center for academic subjects during vacations was also associated with significant differences in GPA, F (1, 97) = 5.30, p = .023, η_p^2 = .05, Korean, F (1, 97) = 9.27, p = .003, η_p^2 = .09, English, F (1, 97) = 8.06, p = .006, η_p^2 = .08, and Social Studies, F (1, 97) = 4.48, p = .037, η_p^2 = .04, for the North Korean students. In all instances, students who attended Children's center performed poorer than those who did not. We should note that the small numbers of North Korean students attending Hagwons, tutoring or mentoring meant that these analyses were insufficiently powered.

For the South Korean students, ANCOVAs controlling for age and SES showed that attendance in Hagwons for academic subjects during vacations was associated with significant differences in GPA, F (1, 58) = 9.36, p = .003, η_p^2 = .14, Korean, F (1, 58) = 4.98, p = .030, η_p^2 = .08, English, F (1, 58) = 11.60, p = .001, η_p^2 = .17, Science, F (1, 58) = 4.32, p = .042, η_p^2 = .07, and Social Studies, F (1, 58) = 5.86, p = .019, η_p^2 = .09. In all instances, students attending Hagwons performed better than students who did not.

Discussion of the Results

This study explored whether differences in home literacy practices (HLP) between North Korean students in SK and South Korean students affect the academic achievement gap between the two groups. To do this, we examined several research questions. The first question was whether there are differences in academic achievement between the two groups. The next four questions focused on differences in HLP as a contributing factor, examining the reports of parents (Question 2.1) and students (Question 3.1) and considering the role of SES in HLP (Questions 2.2 and 3.2). The fourth question was how SES and HLP variables predict academic achievement. The final question was whether the relationships between academic achievement, SES, and HLP are different across the two groups.

Question 1. Are there differences in academic achievement between the North and the South Korean students?

We found that the North Korean students had lower GPAs and other educational outcomes than their South Korean peers. Our findings align with previous results (Han et al., 2013; The Ministry of Education, 2013; United States Government Accountability Office, 2010). It is notable that the observed academic achievement differences were largely explained by SES. Numerous studies have demonstrated that socioeconomic background has a significant effect on students' academic achievement (e.g., Johnson, McGue, & Lacono, 2007; Sirin, 2005; White, 1982). In examining the relationship between SES and academic achievement in the South Korean context, it should be highlighted that there is a widening gap in spending by low- and high-income families on private education (Statistics Korea, 2018), and this factor increases the achievement gap between students from low-income and high-income families (e.g., Choi &

Baek, 2017; Kim, 2007; Moon & Kim, 2003). According to the annual survey by Statistics Korea in 2018, while 58.3 percent of elementary school students from low-income families (that had a monthly household income of $1,700 to $2,600) received private tutoring, 81 percent of students from high-income families (that had a monthly household income of $4,300 to $5,200) attended private tutoring institutes. The data also showed a widening gap in spending on private education between low- and high-income families; $65 vs. $390 per month per child for families that earn less than $1,000 vs. families that earn more than $6500.

Furthermore, Choi, Kwak, Chae, and Park (2011) showed that 84.3% of North Korean students in South Korean schools did not receive private tutoring, and 71.4% of the respondents reported that their limited family income was the main reason for this. Our findings align with the results of prior research and suggest that SES is an especially important factor in the achievement gap experienced by the North Korean students in SK, who are substantially different from their South Korean peers in SES, and mostly come from lower SES families.

We also found that the largest difference in subject-area achievement was observed in English followed by social studies. Prior studies of North Korean students in SK reported that they viewed English as the most difficult subject at the elementary, middle, and high school levels (e.g., Jung et al., 2014). North Korean students in SK scored significantly lower in English on a national standardized test; at the elementary and middle school levels, 47.4 percent and 74.1 percent, respectively, of the North Korean students were below standard academic levels in English (compared to 11.6 percent and 29.4 percent of the South Korean students, respectively). In addition, Jung et al. (2014) showed that 62% of North Korean respondents reported having learned no English before their arrival in SK.

Our findings align with previous results and suggest that it is important to consider the

North Korean students' demographic characteristics when examining their underachievement in English in South Korean schools. That is, we can speculate that the North Korean students' achievement in English is hindered by socio-cultural differences reflected in their demographic characteristics, including limited English learning experiences and the lack of study opportunities during their journey to SK. In the South Korean context, children start learning English earlier than when the formal English education starts in Grade 3, either through private institutes or publicly subsidized pre-schools (Chung & Choi, 2016). The enthusiasm of modern South Korean people for English is so intense that it has been described as a "national religion" (Demick, 2002).

Our findings also strongly support prior results that their overall poor vocabulary influences the North Korean students' English achievement. Jung et al. (2014) suggested that North Korean students in SK face achievement gaps in English caused by their poor (South Korean) vocabulary knowledge; that is, they do not understand the content of English textbooks even in the Korean language. For example, some of them do not understand *Christmas tree* or *grape* (Jung et al., 2014) because they have never seen these items before. Moreover, North Korean defectors may not understand up to 60% of what South Koreans are saying, mainly because of differences in vocabulary between NK and SK (Choe, 2006). For example, they do not understand *vegetable* and *ice cream* because these words take different forms in the two languages. Our findings concur with these results and suggest that it is important to consider differences in (South Korean) vocabulary knowledge between the two groups when examining achievement gaps in English.

Finally, our results show that the South Korean students were significantly better in social studies than their North Korean peers after controlling for SES. In NK's school

curriculum, there is no social studies. In addition, the students who were born in China or educated in Chinese schools, either in Korean folk (Chosun-Chok) schools, where students are taught in Chinese and Korean, or in Han-Chinese (Han-Chok) schools, where students are taught exclusively in Chinese, likely face a variety of challenges related to English and social studies. The social studies curriculum taught in Chinese schools usually reflects socialist ideology and differs ideologically from the educational objectives of South Korea's curriculum. In addition, most China-born students never or rarely learn English in Chinese schools before their arrival in SK. In fact, students from China viewed English and social studies as the most difficult subjects during elementary and middle schools in SK, and 71.4% of the respondents reported different academic contents of the subjects as the main reason for academic difficulty (Choi, Kwak, Chae, & Park, 2011).

In sum, SES contributes to the achievement gap between the North and South Korean students. The North Korean students' demographic characteristics and (South Korean) vocabulary knowledge are particularly important contributors to the North Korean students' underachievement in English and social studies.

Question 2. Are there differences in HLP as reported by parents? Do these differences reflect SES?

North and South Korean parents differed significantly in their home literacy practices. The largest difference was observed in their academic interest and support for their children (reflected in talking about reading and schoolwork), as South Korean parents provided more such support. In addition, the South Korean parents reported engaging in more reading practices (i.e., frequent reading, more access to books and libraries, more subscription to magazine and newspapers, and more investment in books) than the North Korean parents. Similarly, the South

Korean parents reported more digital device access and use (i.e., more digital device ownership, use of online learning for their children, and shorter screen-time limits for their children). In contrast, the North Korean parents themselves reported spending more time on the internet than the South Korean parents.

While the causes of these differences are complex, the variations observed between the two groups in three types of measures (Investment in Books, Library and Bookstore Visits, and Online Educational Resources) can be largely explained by SES. Given that those three measures are more directly linked to socioeconomic resources, it is not surprising that the South Korean parents, who were from higher-income families, reported more investment in books for their children and themselves, more frequent visits to the library and bookstores, and greater use of online educational resources with their children.

A significant correlation between SES and the HLE has likewise been reported in previous studies (e.g., Breen & Jonsson, 2005; Buchmann, 2002; Park, 2008; Shavit, Yossi, & Blossfeld, 1993). Consistent with prior results, our results suggest that the South Korean parents are more likely to provide their children with richer home literacy opportunities. Considering the North Korean parents' occupations and monthly household income in SK, we can expect they may not have enough time to visit a library or bookstore, and may lack money to buy books or use online educational programs, which are usually not free.

Not all differences, however, were related to SES. When SES was controlled for, statistically significant differences remained in the reading of all formats (paper books, eBooks, audiobooks, and digital text), academic interest and support (reflected in talking about their children's reading and schoolwork), parents' internet time, the number of digital devices at home, and the number of online educational resources used by their children. The results

indicate that the South Korean parents reported more reading in all formats, more parental academic interest and support, more digital devices at home, and more online educational resources use for their children, and the North Korean parents reported more time spent on the internet in their home.

It is possible that these differences may reflect social-environmental influences. In examining the relationship between the HLP and sociocultural context in NK, it should be highlighted that there is a unique social classification system (*Songbun*), which negatively impacts North Korean parents' general attitude toward their children's education. Among those in a lower *Songbun*, their family background generally does not permit advanced education beyond high school (except for technical schooling) (Ahn & Min, 2006; Collins, 2012). Students in a higher *Songbun* are treated with privilege by teachers; the same teachers limit access to higher education for students in a lower *Songbun*, even if they perform well in class. After graduating from high school, most students are sent to a farm, mine, construction site, or the military for about ten years. This, as a result, leaves the North Korean people with few prospects and little hope for achieving advanced education (Collins, 2012). In particular, North Korean women believe that a woman does not need to study or read, but to marry a rich man (Ahn & Min, 2006).

Consequently, parents from NK, who are not encouraged to promote family literacy and have relatively poor sociocultural literacy environments, are less likely to engage in home literacy practices than South Korean parents, who may have a richer home literacy and sociocultural environment. It therefore seems possible that the aspects of the home literacy environment in SK reflect particular cultural practices and beliefs in the South Korean context that may not extend to the North Korean context, and vice versa.

Positive associations between culture specific characteristics and home literacy practices have been reported in previous research (Kim, 2009; Leseman & de Jong, 1998; Scollon & Scollon, 1981). Leseman and de Jong (1998) suggested that the home learning environment is embedded within a larger socio-cultural environment. In addition, Kim (2009) argued that culture-specific characteristics should be incorporated into home literacy models. Our findings align with this body of research and further indicate that it is necessary to link the present study about differences in parents' home literacy practices between the two groups with established research about home literacy models in the South Korean context.

Question 3. Are there differences in HLP as reported by students? Do those differences reflect SES?

We found that there were differences between the two groups in the students' response concerning HLP. The largest difference was observed in the number of academic subjects that the students studied in Hagwons followed by the number of hours per day spent in Hagwons for academic subjects during vacations. The results indicate that the South Korean students studied more academic subjects during the school year and vacations and spent more time in Hagwons for academic subjects during vacations. In contrast, the North Korean students reported more time in local children's community centers for their academic subjects.

It is notable that these observed differences were largely explained by SES. Our results support previous findings that South Korean students relied extensively and spent time and money on their private education (e.g., Statistics Korea and the Ministry of Education, 2017). By contrast, most North Korean students in South Korean schools did not receive private tutoring, and their lack of money has been reported as the main reason (Choi, Kwak, Chae, & Park, 2011). Our findings suggest that the students' SES background influences differences in

after-school learning activities between the two groups.

As in the case of parents' reports, however, some of the observed differences may reflect real differences between the groups that are not explained by SES. Like their parents, the South Korean students reported more library visits, more magazine and newspaper reading, more interest in books, and more parents' interest in their children's reading after controlling for SES. This again prompts us to speculate that a unique sociocultural context in NK influences the North Korean parents' HLP, which, in turn, affects the students' HLP.

It should be noted that since there has been no research examining the HLP of North Korean children in NK or SK, and little research on the HLE of older readers (South Korean school-age students) in the Korean context, it is difficult to compare our findings with prior findings. However, we can expect that home literacy environment in NK is quantitatively and qualitatively different from that in SK, based on the information provided by North Korean defectors to Radio Free Asia (2010; 2017) described below.

First, the defectors report that North Korean people have access to few reading materials and books in the home, schools, and libraries due to the lack of paper in NK (Radio Free Asia, 2010). For example, most families in NK have no children's books at home; consequently, there is no shared reading between parents and children (Radio Free Asia, 2010). Access to newspapers in the home is limited to those people who belong to a higher *Songbun*, or who are in a high political position. In addition, the contents of books, including textbooks (Kim, 2006), and other reading materials in NK are mostly focused on their past leaders' beliefs (*Juche* ideology; the official state ideology of NK) (Radio Free Asia, 2010). In NK, all books have been censored, and books that are not related to their past leaders' ideology (e.g., foreign fiction books and classics books) have been forbidden since 1960 (Radio Free Asia, 2010).

Most importantly, many people in NK are suffering from hunger and consequently put much more emphasis on eating than reading (Radio Free Asia, 2010). For these reasons, North Korean people have a low interest in books and reading (Radio Free Asia, 2017). All of this information was confirmed by our informal in-depth interviews with 15 parents, seven teachers working in South Korean schools that participated in the present study, and one project coordinator from NK. Our findings suggest that the students' HLP is closely related to parents' HLP, which is embedded within a large sociocultural context (Leseman & de Jong, 1998); thus, it is necessary to consider cultural variation in some areas of the students' HLP for addressing differences between the two groups.

Question 4. How do SES and HLP variables predict academic achievement? Are the relationships between academic achievement, SES, and HLP different across the two groups?

We found that, for both groups, SES was significantly correlated with academic achievement, although the strength of the relationships varied between the two groups. At the same time, our results showed that the relationships between academic achievement, SES, and HLP were different across the two groups. When SES was controlled for, for the North Korean students, only one HLP variable – the number of digital devices – was significantly correlated with all of the academic outcome measures. For the South Korean students, SES explained a larger number of differences in GPA and Math than HLP; whereas the opposite was true for English. Our findings align with prior results documenting the relationship of SES to academic achievement (e.g., Bloom, 1964; Feinstein, 2003; Johnson, McGue, & Lacono, 2007; Sirin, 2005; White, 1982) and suggest that SES influences the relationship between HLE and academic achievement.

Interestingly, the number of digital devices, such as laptops, tablets, electronic book readers, and smartphones, was significantly and positively associated with all of the academic outcome measures for the North Korean students. Prior research has reported contradictory findings regarding the relationship between digital device use and academic achievement. For example, AlBahri, Aroar, Omar, and Taheri (2018) found a negative correlation between digital media exposure and academic performance of adolescents. In contrast, Malhi, Bharti, and Sidhu (2016) have shown that time spent on the computer is positively associated with academic achievement. For our findings, it is plausible that the number of digital devices in the North Korean students' home may reflect the influence of SES, which is significantly correlated with the North Korean students' academic achievement.

For the South Korean students, the number of hours per day spent using educational programs (e.g., video lessons and tutorials, test prep materials, and web resources in academic subjects) was a significant positive predictor for GPA. Additionally, students attending Hagwons performed better than students who did not. We should note that use of online educational programs and attendance in Hagwons are two different types of private education in SK. As previously mentioned, there is a widening gap in spending on private education between low- and high-income families (e.g., Statistics Korea and the Ministry of Education, 2017). This spending gap increases the achievement gap between students from low-income and high-income families (e.g., Jung & Kim, 2002; Kim, 2007; Kim & Lee, 2005; Moon & Kim, 2003; Shin, 2010). Our findings concur with prior research and suggest that attending after-school learning activities (private education) is an especially important factor that contributes to the achievement gap among South Korean students.

Interestingly, parents' internet time was a significant negative predictor of students'

GPA and of achievement in both English and Science, for South Korean students. As there has been little research on *parents*' internet use (the number of hours per day the parents spent on the internet), it is difficult to compare our findings with prior findings. However, it is possible that when they are distracted by the internet, parents are less able to help their children with homework, to support and acquire special services when necessary, and to assist their children in considering alternative strategies and solutions.

Conclusion

The relationship between the home literacy practices and academic achievement of North Korean students in South Korean schools has not previously been examined. This study has investigated how students' family background and home literacy practices impact the achievement gap between the North Korean students and their South Korean peers. Several of its findings are notable. First, SES as reflected by parents' education and household income largely explained the observed academic achievement differences between the two groups. The two groups differed significantly in the relationship between SES, home literacy practices, and academic achievement. Furthermore, SES was significantly correlated with academic achievement for both groups, but the strength of the relationships varied between them. Accordingly, in considering the challenges facing North Korean students in South Korean schools, it is essential to explore the associations between their academic achievement and home literacy environment as a part of the overall environment that influences academic achievement.

CHAPTER 5

GENERAL DISCUSSION

In recent decades, the academic gap between North and South Korean students has continued to widen (e.g., Kang et al., 2014; Kim et al., 2016). The causes of this disparity are complex and varied, but as we have seen, two kinds of factors may play a key role in exacerbating educational challenges: (1) social factors such as home literacy practices and family backgrounds, and (2) linguistic differences between the two Korean languages.

Both of these areas require more sustained and detailed study. First, several studies of North Korean children in South Korean schools have examined the relationship between the social factors and social outcomes in a school environment. However, although Korean researchers have found an association between these factors and outcomes in schools, there has been no research into the relationship between psychological and social factors and academic outcomes among North Korean students. Similarly, although previous studies have revealed that the distinct linguistic characteristics of Hangul are related to the differing linguistic performance among South Korean children, there has been a paucity of studies examining the relationship between educational outcomes and linguistic differences in the North and South Korean languages, which in turn may influence North Korean students' literacy skills and may, in part, be responsible for limiting their achievement.

To address these gaps in the literature, two studies were conducted. The first study examined if North and South Korean children studying in South Korea differ in their reading, vocabulary, and literacy-related cognitive skills, and whether language and literacy-related skills contribute to reading outcomes among North and South Korean children in the same way. In sum, Study 1 showed that: (1) There were significant between-group differences in all reading tasks;

(2) There were no differences in visual processing skills, and differences in phonological awareness and rapid naming were limited to tasks that likely captured experience or education differences rather than basic cognitive processing differences; (3) There were differences in both measures of vocabulary size and South Korean vocabulary that specifically targeted lexical differences. Of the measures that were used in this study, the South Korean vocabulary measure showed the largest difference between the two groups; and (4) The relationships between cognitive skills, vocabulary knowledge, word and nonword reading skills, and reading comprehension varied across the two groups. The results showed that visual processing was the strongest predictor of reading fluency for the North Korean students whereas phonological awareness was the strongest predictor for the South Korean students. Further, vocabulary predicted reading fluency only for the South Korean students, but reading comprehension for both groups.

The second study investigated whether two social factors, family background and home literacy practices, are associated with the achievement gap between North and South Korean students. The five major findings from Study 2 were: (1) There were significant differences in academic achievement. The largest difference was observed in English followed by social studies; (2) Family's socioeconomic status, as measured by parents' education and household income, explained the observed academic achievement differences between the two groups with the exception of social studies; (3) The two groups differed significantly in parents' home literacy practices. The largest difference was observed in parents' reported academic interest and support (talking about reading and schoolwork) with their children; (4) The two groups also differed significantly on students' home literacy practices. The largest difference was observed in the number of academic subjects that the students studied in Hagwons followed by hours per day

spent in Hagwons for academic subjects during vacations; and (5) The number of digital devices available in the household was positively associated with all academic outcome measures for the North Korean students. In contrast, attending after-school learning activities (private education) was an especially important contributor to achievement among South Korean students.

Together, the results of the two studies provide further insight into poor educational outcomes among the North Korean students in South Korea, and how social and psychological factors influence their academic achievement, including their linguistic performance. The current dissertation thus extends previous studies in three ways: (a) by examining the relationship between social factors and academic achievement among North Korean students; (b) by manipulating the specific linguistic differences between the two Korean languages, which are often mistaken for the same language; and (c) by examining the extent to which the specific linguistic differences between the two Korean languages affect reading performance among the defector children.

Its findings carry important practical implications for Korean children's literacy instruction. They may inform classroom instruction and help develop better teaching approaches, methods, and activities. Furthermore, the information gained in this study raises a number of implications for teacher education and the role of North Korean parents in supporting their children's education. Our findings support the use of classroom practices that consider differences between the two groups and that are systematically differentiated in the content, difficulty level of instruction, and classroom activities based on students' vocabulary and reading skills.

New programs for teacher education might be designed to prepare North Korean teachers in South Korea for a professional role as a practitioner by taking their work experience

in North Korea into consideration. Currently, no regular and systematic education for them is available in South Korea. The Korean Educational Development Institute launched a pilot project, called North Korean Teachers Academy (NKTA), in 2010 to offer a basic understanding of South Korean education to North Korean teachers in South Korea. However, the short-term (60 hours in six days) program mainly focuses on their adaptation to SK. The education of North Korean students in South Korean schools needs to be a team effort by dedicated teachers, parents, and the students themselves. The North Korean teachers can play both a direct and an indirect role in the parent-student-teacher relationship as a mediator. They can facilitate interactions between South Korean teachers and North Korean parents, South Korean teachers and North Korean students, and North Korean parents and students by making use of their work experiences in North Korea as a teacher and of their adaption experience in South Korea as a defector. They can also help the North Korean parents to accept the (educational) culture their children are learning and to support their education. Moreover, they can directly support the North Korean students in the classrooms as one-on-one tutors and assistant teachers by applying their past work experience.

Perhaps the most important finding, however, is that the largest difference between North and South Korean respondents was observed in parents' academic interest and support for their children, as reflected in their reported conversations about reading and schoolwork. Despite North Korean parents' desire for their children to succeed in South Korean schools, there remains a disconnect between attitudes and behaviors. The results suggest that the significant role of parents in their child's education is less well understood by North Korean parents, who have not been encouraged to promote family literacy, come from a country with relatively poor sociocultural literacy environments, and may not know how to interact successfully with the new

education system in South Korea. Given the impact of parental involvement on their children's academic achievement, it is therefore important to foster stronger parent-child interactions by developing and coordinating school-wide parent-teacher-student partnerships.

Furthermore, the findings of the present study should be considered by the South Korea's various ministries and agencies responsible for the education of North Korean students in South Korea. These include the Ministry of Unification, the Ministry of Education, Korean Educational Developent Institute's Education Support Center for North Korean students, Hanawon, and 22 Hana Centers (regional adaptation centers). Additionally, the findings should be considered by the international educational community in terms of understanding the educational needs of North Korean students and the barriers they face.

The present studies have some limitations. First, Study 2 focused only on specific aspects of social differences in family backgrounds and home literacy practices, and there is undoubtedly much more to be learned about cultural differences between North and South Korean learners. It would be useful for future research to explore the influence of students' cultural differences on their learning in various subject areas. Second, the first study focused only on differences in visual skills, vocabulary (word meaning), and phonology (phoneme and syllable), and it would also be useful to investigate the impact of additional linguistic differences, including morphology, syntax, and semantics (phrase and sentence levels), on North Korean students' literacy skills and on the achievement gap between North and South Korean students.

In addition, it remains to be examined how psychological problems (e.g., post-traumatic stress disorder; PTSD) affect individual differences in academic achievement among North Korean students. Many North Korean students have undergone traumatic experiences, such as escaping from dangerous situations and staying in unsafe refugee camps, sometimes observing

death, being tortured or raped, or witnessing their family members facing execution. As a result, they often display the symptoms of PTSD, such as anxiety, feelings of helplessness, and aggressive and violent behaviors (e.g., Jeon, Eom, & Min, 2013; Yoon & Oh, 2010). How presense and severity of PTSD symptoms affect North Korean students' ability to learn has not been examined.

The current research and its findings should be considered only as an important initial step in understanding the psychological and social factors that influence educational outcomes – reading performance and academic achievement– of North Korean students in South Korea. The two studies reported in this dissertation offer valuable insights into the academic underachievement of North Korean students in South Korea. Hopefully, they will inspire further research, including intervention research examining whether some of the suggestions here can reduce the gap between North and South Korean students.

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Appendices

Appendix A

The examples of differences between SK and NK in lexicon

Meaning	SK	Written characters in IPA	NK	Written characters in IPA
Fat	지방	ci.baŋ	기름	ki.lɨm
Soon	금방	kɨm.baŋ	가지	ka.ci
Lunch box	도시락	to.si.lak	곽밥	kwak.pap
Citizen	국민	kuk.min	인민	in.min
Weather	날씨	nal.ssi	날거리	nal.kʌ.li
Within	이내	i.nɛ	인차	in.ʧa
Minus	빼기	ppɛ.ki	덜기	tʌl.ki
Parking lot	주차장	cu. ʧa.caŋ	차마당	ʧa.ma.taŋ
Gathering	집합	cip.hap	모임	mo.im
Hardship	곤란	kon.lan	곤난	kon.nan
Knock	노크	no.kɨ	손기척	son.ki. ʧʌk
Quite	퍽이나	pʌk.i.na	퍼그나	pʌ.kɨ.na
No	아니요	a.ni.yo	아니오	a.ni.o
Spouse	배우자	pɛ.u.ca	짝씨	ccak.ssi
Hill	언덕	ʌn.tʌk	잔메	can.me
Wife	아내	a.nɛ	안해	an.hɛ
Top	위	wi	우	u
Vegetable	채소	ʧɛ.so	남새	nam.sɛ
Egg	달걀	tal.kyal	닭알	tak.al
Fishermen	어부	ʌ.pu	어로공	ʌ.lo.koŋ
Elementary school	초등학교	ʧo.tɨŋ.hak.kyo	인민학교	in.min. hak.kyo
Break	부수다	pu.su.ta	부시다	pu.si.ta
Beef	쇠고기	soe.ko.ki	소고기	so.ko.ki
Milk	우유	u.yu	소젖	so.cʌt
Date	날짜	nal.cca	날자	nal.ca

Appendix A continued

Meaning	SK	Written characters in IPA	NK	Written characters in IPA
Growth ring	나이테	na.i.te	해돌이	hɛ.tol.i
Color	색깔	sɛk.kkal	색갈	sɛk.kal
Teeth	이빨	i.ppal	이발	i.pal
Dress	드레스	tɨ.le.sɨ	나리옷	na.li.ot
Ribbon	리본	li.pon	댕기	tɛŋ..ki
Revenge	복수	pok.su	복쑤	pok.ssu
Friction	마찰	ma.ʧal	쓸림	ssɨl.lim
Piece	조각	co.kak	쪼각	cco.kak
Checkpoint	검문소	kʌm.mun.so	검열소	kʌm.yʌl.so
Result	결과	kyʌl,kwa	후과	hu.kwa
Runaway	가출	ka.ʧul	탈가	tal.ka
Farm	농가	noŋ.ka	농호	noŋ.ho
Good harvest	대풍년	tɛ.punŋ.nyʌ	만풍년	man. punŋ.nyʌ
Side dish	반찬	pan. ʧn	식찬	sik. ʧn
Nursing home	양로원	yaŋ.lo.wʌn	양생원	yaŋ.sɛŋ.wʌn
Understanding	양해	yaŋ.hɛ	료해	lyo. hɛ
Entrance	입구	ip.ku	초입	ʧo.ip
One's writing	저서	cʌ.sʌ	로작	lo.cak
Oriental medicine	한약	han.yak	동약	toŋ.yak
School hours	수업시간	su.ʌp.si.kan	상학시간	saŋ.hak. si.kan
Exhibition	전시물	cʌn.si.mul	직관물	cik.kwan.mul.
Domestic and foreign	국내외	kuk.nɛ.ye	해내외	hɛ.nɛ.ye
Mutual	상호간	saŋ.ho.kan	호상간	ho.saŋ.kan
Purse	손가방	son.ka.paŋ	들가방	til. ka.paŋ

Appendix B

B.1. Student Questionnaire on Demographics

The following survey will be used to help us learn about the students who participate in the study. For each question, please choose the response that best describes you.

Gender:

Female _____
Male _____

Class status:

Grade 3 _____
Grade 4 _____
Grade 5 _____
Grade 6 _____
Grade 7 _____
Grade 8 _____

Age:

Under 10 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 or above _____

The place of birth:

North Korea (NK) _____
China _____
Other (please specify) _____

If NK, how long did you live there before your arrival in South Korea (SK)?

Less than 3 years _____
3-5 years _____
5-7 years _____
7-9 years _____
9-11 years _____
11 years or more _____

How long did you stay in other countries other than NK before your arrival in SK?

Less than 1 year _____
1-2 years _____
2-3 years _____
3-4 years _____
4-5 years _____
5 years or more _____

What is the highest grade or year of school you completed in NK?

Never attended school _____
Only attended kindergarten _____
Grade 1 _____
Grade 2 _____
Grade 3 _____
Grade 4 _____
Grade 5 _____
Grade 6 _____
Grade 7 _____
Grade 8 _____
Grade 9 or above _____

What is the highest grade or year of school you completed in another country?

Never attended school _____
Only attended kindergarten _____
Grade 1 _____
Grade 2 _____
Grade 3 _____
Grade 4 _____
Grade 5 _____
Grade 6 _____
Grade 7 _____
Grade 8 _____
Grade 9 or above _____

How long have you been living in SK?

Less than 1 year _____
1-2 years _____
2-3 years _____
3-4 years _____
4-5 years _____
5 years or more _____

Which of the following are applicable to your living situation in SK? (Check all that apply)

I live alone. _____
I live with my siblings. _____
I live with a parent. _____

I live with parents. _____
I live with a guardian. _____
I live with relatives. _____
I live with people other than those above. _____

Thank You

B.2. Parent/Guardian Questionnaire on SES

The following survey is designed to gain a better understanding of your family's socioeconomic status (SES). It is divided into three parts, dealing with parental education level, parental occupation, and household income. For each question, please choose the response that best describes your situation. If a child participating in the study is presently not living with his/her parent(s), the respondent who answers the questions below can be a guardian who takes care of the child at present.

Part 1. Parental Education Level and Occupation

Please specify who the student lives with:

Father___ *Mother___* *Legal Guardian___* *Other(please specify)* _____

The Child's Father

What is the highest level of education you have attained?

Some elementary school studies	_____
Completed elementary school	_____
Some middle school studies	_____
Completed middle school	_____
Some high school studies	_____
Completed high school	_____
Some community college	_____
Completed college diploma	_____
Some university studies	_____
Completed university degree	_____
Some graduate or professional studies	_____
Completed graduate or professional degree	_____

What is your present occupational position or (if you are no longer working) what was your last position?

Laborer	*Unskilled*	_____
	Trained on the job	_____
	Skilled	_____
	Foreman	_____
Self-employed	*Independent or co-op farmer*	_____
	Professional or independent academic	_____

	Independent with up to 9 employees	_____
	Independent with 10 or more employees	_____
Manager/Professional	*With special qualifications (e.g., a marketing specialist)*	_____
	In highly specialized position (e.g., a physician)	_____
	In leadership position (e.g., an executive)	_____
Civil servant	*Lower level service*	_____
	Middle level service	_____
	Higher level service	_____
	Upper level service	_____
Other	*Please specify*_____	_____

Which of the following statements about occupational status apply to you?

Not working at the moment _____
Part-time or hourly work (less than 15 hours per week) _____
Part-time work (15 to 34 hours per week) _____
Full-time work _____
On temporary leave (e.g., sick leave) _____
In training (apprentice) _____

The Child's Mother

What is the highest level of education you have attained?

Some elementary school studies _____
Completed elementary school _____
Some middle school studies _____
Completed middle school _____
Some high school studies _____
Completed high school _____
Some community college _____
Completed college diploma _____
Some university studies _____
Completed university degree _____
Some graduate or professional studies _____
Completed graduate or professional degree _____

What is your present occupational position or (if you are no longer working) what was your last position?

Laborer	*Unskilled*	_____
	Trained on the job	_____
	Skilled	_____
	Foreman	_____
Self-employed	*Independent or co-op farmer*	_____
	Professional or independent academic	_____

	Independent with up to 9 employees	_____
	Independent with 10 or more employees	_____
Manager/Professional	*With special qualifications (e.g., a marketing specialist)*	_____
	In highly specialized position (e.g., a physician)	_____
	In leadership position (e.g., an executive)	_____
Civil servant	*Lower level service*	_____
	Middle level service	_____
	Higher level service	_____
	Upper level service	_____
Other	*Please specify*_____	_____

Which of the following statements about occupational status apply to you?

Not working at the moment	_____
Part-time or hourly work (less than 15 hours per week)	_____
Part-time work (15 to 34 hours per week)	_____
Full-time work	_____
On temporary leave (e.g., sick leave)	_____
In training (apprentice)	_____

The Child's Guardian

What is the highest level of education you have attained?

Some elementary school studies	_____
Completed elementary school	_____
Some middle school studies	_____
Completed middle school	_____
Some high school studies	_____
Completed high school	_____
Some community college	_____
Completed college diploma	_____
Some university studies	_____
Completed university degree	_____
Some graduate or professional studies	_____
Completed graduate or professional degree	_____

What is your present occupational position or (if you are no longer working) what was your last position?

Laborer	*Unskilled*	_____
	Trained on the job	_____
	Skilled	_____
	Foreman	_____
Self-employed	*Independent or co-op farmer*	_____
	Professional or independent academic	_____
	Independent with up to 9 employees	_____
	Independent with 10 or more employees	_____

Manager/Professional	*With special qualifications (e.g., a marketing specialist)*	_____
	In highly specialized position (e.g., a physician)	_____
	In leadership position (e.g., an executive)	_____
Civil servant	*Lower level service*	_____
	Middle level service	_____
	Higher level service	_____
	Upper level service	_____
Other	*Please specify*_____	_____

Which of the following statements about occupational status apply to you?

Not working at the moment	_____
Part-time or hourly work (less than 15 hours per week)	_____
Part-time work (15 to 34 hours per week)	_____
Full-time work	_____
On temporary leave (e.g., sick leave)	_____
In training (apprentice)	_____

Part 2. Household Income

Note. The household income referred to below is defined as "mean net household income after taxes and mandatory contributions" in this survey.

What is the monthly household income (USD)?

Less than $1,000	_____
$1,000 − $1,500	_____
$1,500 − $2,000	_____
$2,000 − $2,500	_____
$2,500 − $3,000	_____
$3,000 − $3,500	_____
$3,500 − $4,000	_____
$4,000 − $4,500	_____
$4,500 − $5,000	_____
$5,000 − $ 6,000	_____
$6,000 − $8,000	_____
$8,000 − $10,000	_____
$10,000 or more	_____

Appendix C

C.1. Items in the Phoneme Elision Task

	Before elision	Elided	After elision
Two-syllable word	poc-kit /poc-kit/	/p/	/oc-kit/
	jack-it /dʒæk-it/	/dʒ/	/æk-it/
	rinn-er /ri-nə/	/n/	/ri-ə/
	citt-le /ci-tl/	/t/	/ci-l/
	vell-ey /væl-i/	/i/	/væl/
	van-dle /van-dl/	/l/	/van-d/
	pen-ther /pen-θə/	/θ/	/pen-ə/
	mir-ble /mi:r-bl/	/b/	/mi:r-l/
Three-syllable word	ha-mi-ly /hæ-mə-li/	/h/	/æ-mə-li/
	di-part-mint /di-pɑ:rt-mint/	/p/	/di-ɑ:rt-mint/
	car-ten-per /kɑ:r-tən-pə(r)/	/n/	/kɑ:r-tə-pə(r)/
	ve-ta-min /ve-tə-min/	/m/	/ve-tə-in/
	di-sem-ber /di-sem-bə(r)/	/b/	/di-sem-ə(r)/
	fan-da-stic /fæn-dæ-stık/	/t/	/fæn-dæ-sık/
	um-der-stand /ʌm-dər-stænd/	/n/	/ʌm-dər-stæd/

C.2. Items in the Syllable Deletion Task

Position	Before deletion		After deletion in given positions		Ranking/ Frequency
	SK	NK	SK	NK	
1st syllable	나룻배/na.lut.pɛ/	나루배/na.lu.pɛ/	/lut.pɛ/	/lu.pɛ/	9953/15
	나뭇잎/na.mut.ɪp/	나뭇잎/na.mu.ɪp/	/mut.ɪp/	/mu.ɪp/	4778/39
	아랫방/a.lɛt.paŋ/	아래방/a.lɛ.paŋ/	/lɛt.paŋ/	/lɛ.paŋ/	24059/4
	고깃국/ko.kɪt.kuk/	고기국/ko.kɪ.kuk/	/kɪt.kuk/	/kɪ.kuk/	22470/4
	혼잣말/hon.cat.mal/	혼자말/hon.ca.mal/	/cat.mal/	/ca.mal/	8997/18
2nd syllable	여행/yʌ.hɛŋ/	려행/lyʌ.hɛŋ/	/yʌ/	/lyʌ/	984/226
	이유/ɪ.yu/	리유/lɪ.yu/	/ɪ/	/lɪ/	249/784
	예절/yɛ.cʌl/	례절/lyɛ.cʌl/	/yɛ/	/lyɛ/	2449/88
	내일/nɛ.ɪl/	래일/lɛ.ɪl/	/nɛ/	/lɛ/	1270/181
	녹음/nok.ɨm/	록음/lok.ɨm/	/nok/	/lok/	22856/4
	햇수/hɛt.su/	해수/hɛ.su/	/hɛt/	/hɛ/	57485/1
	숫자/sut.ca/	수자/su.ca/	/sut/	/su/	1820/122
	댓잎/tɛt.ɪp/	대잎/tɛ.ɪp/	/tɛt/	/tɛ/	–
	냇가/nat.ka/	내가/nɛ.ka/	/nat/	/nɛ/	11030/13
	잇몸/ɪt.mom/	이몸/ɪ.mom/	/ɪt/	/ɪ/	21560/5
3rd syllable	논하다/non.ha.ta/	론하다/lon.ha.ta/	/non.ha/	/lon.ha/	3859/51
	이정표/ɪ.cʌŋ.pyo/	리정표/lɪ.cʌŋ.pyo/	/ɪ.cʌŋ/	/lɪ.cʌŋ/	21506/5
	나침반/na.ʧim.pan/	라침반/la.ʧim.pan/	/na.ʧim/	/la.ʧim/	3265/62
	여학생/yʌ.hak.sɛŋ/	려학생/lyʌ.hak.sɛŋ/	/yʌ.hak/	/lyʌ.hak/	3287/62
	노동자/no.toŋ.ca/	로동자/lo.toŋ.ca/	/no.toŋ/	/lo.toŋ/	792/277

C.3. Items in the Vocabulary Difference Task (SK Vocabulary)

	SK	NK	Meaning
1	아내/a.nɛ/	안해/an.hɛ/	Wife
2	아파트/a.pa.tɨ/	고층살림집/ko.ʧʰɨŋ.sal.lɪm.cɪp/	Apartment
3	오후/o.hu/	낮후/nat.hu/	Afternoon
4	공무원/koŋ.mu.wʌn/	정무원/cʌŋ.mu.wʌn/	Civil servant
5	가게/ka.kɛ/	가가/ka.ka/	Store
6	스님(승려)/sɨ.nɪm/	중선생/cuŋ.sʌn.sɛŋ/	Buddhist monk
7	청소/ʧʰʌŋ.so/	청결/ ʧʰʌŋ.kyʌl/	Cleaning
8	라디오/la.dɪ.o/	라지오/la.cɪ.o/	Radio
9	만화/man.hwa/	이야기그림/ɪ.ya.kɪ.kɨ.lɪm/	Cartoon
10	날씨/nal.ssɪ/	날거리/nal.kʌ.lɪ/	Weather
11	이마/ɪ.ma/	액/ɛk/	Forehead
12	그늘/kɨ.nɨl/	능쪽/nɨŋ.ccok/	Shadow/shade
13	화장실/hwa.caŋ.sɪl/	위생실/wɪ.sɛŋ.sɪl/	Washroom
14	우유/u.yu/	소젖/so.cʌt/	Milk
15	공/koŋ/	뽈/ppol/	Ball
16	공항/koŋ.haŋ/	항공역/haŋ.koŋ.yʌk/	Airport
17	뇌물/nɛ.mul/	꾹돈/kkuk.ton/	Bribe
18	투수/tu.su/	넣는사람/nʌt.nɨn.sa.lam/	Pitcher(baseball)
19	지하철/cɪ.ha.ʧʌl/	지철/cɪ.ʧʌl/	Subway
20	무덤/mu.tʌm/	분굴/pun.kul/,분상/pun.saŋ/,분총/pun.ʧoŋ/	Grave/tomb
21	언덕/ʌn.tʌk/	잔메/can.mɛ/	Hill
22	캠페인/kɛm.pɛ.ɪn/	깜빠니아/kkam.ppa.nɪ.a/	Campaign
23	결혼식/kyʌl.hon.sɪk/	례식/lɛ.sɪk/	Wedding(ceremony)
24	계단/kɛ.tan/	디대/tɪ.tɛ/	Staircase
25	토요일/to.yo.ɪl/	문화일/mun.hwa.ɪl/	Saturday
26	이빨/ɪ.ppal/	이발/ɪ.pal/	Tooth
27	서랍/sʌ.lap/	빼람/ppɛ.lam/	Drawer
28	사위/sa.wɪ/	서랑자/sʌ.laŋ.ca/	Son-in-law
29	관광객/kwan.kaŋ.kɛk/	관광자/kwan.kaŋ.ca/	Tourist
30	교도소/kyo.to.so/	교화소/kyo.hwa.so/	Prison/jail
31	배우자/pɛ.u.ca/	짝씨/ccak.ssi/	Spouse
32	라면/la.myʌn/	꼬부랑국수/kko.pu.laŋ.kuk.su/	Instant noodle
33	오토바이/o.to.pa.ɪ/	모터찌클/mo.tʌ.ccɪ.kɨl/	Motorcycle
34	마찰/ma.ʧal/	쓸림/ssɨl.lɪm/	Friction

Table C.3. continued

	SK	NK	Meaning
35	냉장고/nɛŋ.caŋ.ko/	냉동고/nɛŋ.toŋ.ko/	Fridge
36	밥상/pap.saŋ/	식안/sɪk.an/	(Dining) table
37	커튼/kʌ.tɨn/	창가림막/ʧaŋ.ka.lɪm.mak/	Curtain
38	태아/tɛ.a/	태아이/tɛ.a.ɪ/	Fetus
39	화장품/hwa.caŋ.pum/	화장료/hwa.caŋ.lyo/	Cosmetic products
40	반찬/pan.can/	찔게/cci.kɛ/	Side dish
41	터널/tʌ.nʌl/	차굴/ʧa.kul/	Tunnel
42	차례/ʧa.lyɛ/	아준위/a.cun.wɪ/	Order/turn
43	주차장/cu.ʧa.caŋ/	차마당/ʧa.ma.taŋ/	Parking lot
44	파장/pa.caŋ/	물결길이/mul.kyʌ.kɪl.ɪ/	Wavelength
45	도시락/to.sɪ.lak/	곽밥/kwak.pap/	Lunch box
46	수첩/su.ʧʌp/	목책/mok.ʧɛk/	Notebook/diary
47	채소/ʧɛ.so/	남새/nam.sɛ/	Vegetable
48	초등학교/ʧo.tɨŋ.hak.kyo/	인민학교/ɪn.mɪn.hak.kyo/	Elementary school
49	장난감/caŋ.nan.kam/	놀이감/nol.ɪ.kam/	Toy
50	막걸리/mak.kʌl.lɪ/	탁주/tak.cu/	Korean rice wine

C.4. Items in the Word Reading Task

Two-syllable		Three-syllable		Four-syllable
강물	설탕	우주선	계기판	삼삼오오
얼음	주인	마우스	떡방아	개구쟁이
두부	소금	사진기	지휘자	자유시간
기름	여름	손가락	경제학	카스텔라
공기	수박	일주일	리듬감	스파케티
우산	자라	고양이	공사중	피카디리
시계	참외	오르간	시간표	아프리카
모자	모과	사다리	마지막	하모니카
장갑	택시	승용차	외국어	대한민국
한글	전화	번호판	설계도	사필귀정
사자	기판	벽돌집	제조법	지휘본부
용기	기회	축구공	탈취제	알람시계
거울	궤짝	휘발유	청량감	현장검증
신문	위화	계산기	객관식	카트리지
바지	괴팍	교과서	초보자	전화위복
무릎	교육	충전소	메모리	노르웨이
가위	지위	게시판	광주리	출국심사
바다	휘장	방명록	교과서	영화감독
아래	환산	자긍심	독일어	수학여행
왼쪽	유용	전동톱	스위스	고진감래

C.5. Items in the Nonword Reading Task

Two-syllable		Three-syllable		Four-syllable
감물	설당	우수전	제비간	잠삼오요
얼흠	주힌	바우스	틱망아	제구쟁이
두무	소믄	자신기	시와지	사뮤시감
키름	여릅	손마락	점대헉	가스메라
곰기	수막	인주인	리믐밤	스마케디
우신	사라	고양비	송가쥰	미카티리
지제	참위	오류간	기산묘	아므리카
모지	보과	사따리	바시막	아모니가
정갑	댁시	승융차	외국어	머한신국
안글	전휘	먼호판	젤시모	사밀귀청
시지	기만	먹돌집	세조멉	지휘몬부
옹지	기휘	축쿠공	달쥐세	알랑지겨
저올	궤작	위말유	정닌강	연징곰증
진분	위호	게산리	객광족	가드리시
마지	괴박	고과시	조모자	선와위북
무플	고육	중천소	데모리	노르위히
기위	지외	게지반	괌수리	줄국심바
마나	외싱	망병혹	교과저	엄화감목
어래	환살	자준신	목일며	수악어맹
윈쪽	유응	전웅톨	스휘즈	고닌강패

Appendix D

D.1. Principal Letter of Information

Dear Sir/Madam,

I am writing to ask your permission to allow your students to participate in my research study called *Factors affecting Academic Achievement of North Korean students in South Korean School.* I, Jeongsuk Jang, am a graduate student in the Department of Educational Psychology, University of Alberta, Canada, and I am doing this study for my PhD Degree under the supervision of Professor Rauno Parrila. Please read the information on the study below.

Background

The migration of North Korean defectors to South Korea has increased dramatically in the last two decades. As women make up the majority of defectors, the number of children and youth who are brought directly from North Korea, or who were born in other countries, continues to increase. To find a more durable humanitarian solution for North Korean students in South Korean schools, the South Korean government has offered them educational services and programs since 2009. However, North Korean students who attend schools in South Korea generally tend to lag behind and often fail to catch up with their South Korean peers, and the academic gap between North and South Korean students has continued to widen. This may also explain why students from the North have higher school drop-out rates. However, no research has yet addressed the specific factors that explain the academic underachievement of North Korean students, which may relate to both psychological and social factors.

The Study

The present study will seek to address this gap by examining the link between social and psychological factors and poor educational outcomes. It will include two studies. Study 1 will investigate psychological factors affecting the achievement gap between North and South Korean students. Study 2 will examine how social factors affect the achievement gap between the two groups of students. The factors on which the studies will focus are students' linguistic and cognitive skills (psychological factors) and students' family background and home literacy practices (social factors).

Participant Involvement

Phase 1. Seventyfive students at each of the elementary and middle school grades targeted (Grades 3-8) will participate in Phase l. Of the total of 450 participants150 will be students who moved directly from NK to SK, 150 will be students who spent significant amount of time in China or other countries on their way to SK, and 150 will be students born in South Korea to South Korean parents. Children in each grade will be given an assessment battery consisting of tests of phonological awareness, rapid automatized naming, visual skill, vocabulary, word and pseudoword reading, and reading comprehension. The assessment battery will be administered individually to each student in a quiet classroom in two sessions of roughly

30 minutes each.

Phase 2. One hundred students in each of the elementary and middle school grades targeted (Grades 3-8) will participate in Study 2. Of the total of 600 participants, 300 will be from NK and 300 from SK. Parents/guardians and teachers of the students will also be asked to fill out questionnaires. The student questionnaires will be administered in groups of approximately 10 during class time in the schools on a schedule that will be provided by school principals. Each student will be asked to complete the questionnaires in approximately 30 minutes in the presence of the researcher or a research assistant. The parent/guardian questionnaires will be sent to home with the student on a single occasion. The teacher questionnaires will be administered in the classrooms in the presence of the researcher or a research assistant.

What we promise

Each phase will only begin with your student's consent to take part and the student may decide to end his/her participation in the study at any time. Name of your student will not be used in my dissertation or in any published work. I will take notes on how the student performs the reading activities and might record the time he/she takes to complete a task. The activities are like everyday classroom activities and there are no known risks or discomfort involved in any of these activities. The results will not have any effect upon your student's grades. I will do my best to ensure that your student will enjoy the activities. The protection of the privacy of students who participate in this study is very important to us. Therefore, all data will be kept in a locked drawer at the University of Alberta and only I will have access to the full data.

Parents/guardians of the children will also be given an information letter. I have herewith attached a copy of that letter too for your information. A report on the overall performance of your students can be provided upon your request. I will use the full data in my dissertation and research papers. I wish to start the study in mid March and finish it by early June, 2016. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (+1) 780-492-2615.

I appreciate your support for my research. If you have any questions about this study, please contact my research supervisor, Dr. Rauno Parrila at (+1)780-492-3696 (rauno.parrila@ualberta.ca), or me at (+82) 010-3606-4692 (South Korea), (+1) 587- 778-6630 (Canada) (jeongsuk@ualberta.ca). In order for your students to participate in the project, please complete and return the attached form to me. If you decide to withdraw your students from the project, you can do so without having to provide any explanation. The deadline date for requesting withdrawal from the study is June 4, 2016.

Thank you for your help.

Jeongsuk Jang
Department of Educational Psychology
University of Alberta, CANADA

Research Study Consent Form

I understand that I am being asked to allow students in my school to participate in a research study entitled *Factors Affecting Academic Achievement of North Korean Students in South Korean Schools*. I understand that the purpose of this project is to examine the influence of social and psychological factors and to investigate how they affect academic achievement. I have read and understood the Letter of Information, and have had the questions answered to my satisfaction.

I understand that my students will participate in this study in March to June 2016, that the assessment battery will be administered individually to each student in two sessions of roughly 30 minutes each, and that the student questionnaires will be administered in groups of approximately 10 during class time in the schools on a schedule, and each student will be asked to complete the questionnaires in approximately 30 minutes. Notes will be taken during testing and the time students take to complete reading tasks will be recorded. These activities will only begin and continue as long as the students are interested, and he/she may decide to end his/her participation in the study at any time.

I understand that all data will be kept confidential and that the names of students will not be used in any published work. I understand that children can withdraw from the study at any time without any consequence, and that the deadline date for requesting withdrawal from the study is June 4, 2016. I understand that there are no known risks, discomforts or inconveniences involved in the study. I understand that this consent is for March-June 2016 period only.

I understand that the plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, I can contact the Research Ethics Office at (780) 492-2615. For any other questions, concerns or complaints that I may have, I can contact the research supervisor Dr. Rauno Parrila at (+1)780-492-3696 (rauno.parrila@ualberta.ca), or Jeongsuk Jang at (+1) 587-778-6630 (Canada) and (+82) 010-3606-4692 (South Korea) (jeongsuk@ualberta.ca).

_____I consent that students of my school participate

_____I do NOT consent that students of my school participate.

Name of the principal:_____

Signature:_____

Date: :_____

D. 2. Teacher Letter of Information

Dear teacher,

You are invited to participate in my research study called *Factors affecting Academic Achievement of North Korean students in South Korean School.* I, Jeongsuk Jang, am a graduate student in the Department of Educational Psychology, University of Alberta, Canada, and I am doing this study for my PhD Degree under the supervision of Professor Rauno Parrila. Please read the information on the study below.

Background

The migration of North Korean defectors to South Korea has increased dramatically in the last two decades. As women make up the majority of defectors, the number of children and youth who are brought directly from North Korea, or who were born in other countries, continues to increase. To find a more durable humanitarian solution for North Korean students in South Korean schools, the South Korean government has offered them educational services and programs since 2009. However, North Korean students who attend schools in South Korea generally tend to lag behind and often fail to catch up with their South Korean peers, and the academic gap between North and South Korean students has continued to widen. This may also explain why students from the North have higher school drop-out rates. However, no research has yet addressed the specific factors that explain the academic underachievement of North Korean students, which may relate to both psychological and social factors.

The Study

The present study will seek to address this gap by examining the link between social and psychological factors and poor educational outcomes. It will include two studies. Study 1 will investigate psychological factors affecting the achievement gap between North and South Korean students. Study 2 will examine how social factors affect the achievement gap between the two groups of students. The factors on which the studies will focus are students' linguistic and cognitive skills (psychological factors) and students' family background and home literacy practices (social factors).

Participant Involvement

Phase 1. Seventy five students at each of the elementary and middle school grades targeted (Grades 3-8) will participate in Phase l. Of the total of 450 participants150 will be students who moved directly from NK to SK, 150 will be students who spent significant amount of time in China or other countries on their way to SK, and 150 will be students born in South Korea to South Korean parents. Children in each grade will be given an assessment battery consisting of tests of phonological awareness, rapid automatized naming, visual skill, vocabulary, word and pseudoword reading, and reading comprehension. The assessment battery will be administered individually to each student in a quiet classroom in two sessions of roughly 30 minutes each.

Phase 2. One hundred students in each of the elementary and middle school grades targeted (Grades 3-8) will participate in Study 2. Of the total of 600 participants, 300 will be from NK and 300 from SK. Parents/guardians and teachers of the students will also be asked to fill out questionnaires. The student questionnaires will be administered in groups of approximately 10 during class time in the schools on a schedule that will be provided by school principals. Each student will be asked to complete the questionnaires in approximately 30 minutes in the presence of the researcher or a research assistant. The parent/guardian questionnaires will be sent to home with the student on a single occasion. The teacher questionnaires will be administered in the classrooms in the presence of the researcher or a research assistant.

What we promise

Phase 2 will begin with your consent to take part and you may decide to end your participation in the study at any time. Name of participants will not be used in my dissertation or in any published work. The protection of the privacy of teachers who participate in this study is very important to us. Therefore, all data will be kept in a locked drawer at the University of Alberta and only I will have access to the full data. I wish to start the study in mid March and finish it by early June, 2016.

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (+1) 780-492-2615.

I appreciate your support for my research. If you have any questions about this study, please contact my research supervisor, Dr. Rauno Parrila at (+1)780-492-3696 (rauno.parrila@ualberta.ca), or me at (+82) 010-3606-4692 (South Korea), (+1)587-778-6630 (Canada) (jeongsuk@ualberta.ca).In order for you to participate in the project, please complete and return the attached form to me. If you decide to withdraw yourself from the project, you can do so without having to provide any explanation. The deadline date for requesting withdrawal from the study is June 4, 2016.

Thank you for your help.

Yours sincerely,

Jeongsuk Jang
Department of Educational Psychology
University of Alberta, CANADA

Research Study Consent Form (Teacher)

I understand that I am being asked to participate in a research study entitled *Factors Affecting Academic Achievement of North Korean Students in South Korean Schools*. I understand that the purpose of this project is to examine the influence of social and psychological factors and to investigate how they affect academic achievement. I have read and understood the Letter of Information, and have had the questions answered to my satisfaction.

I understand that I will participate in the Phase 2 of the study in March to June 2016, and that I will be asked to complete the teacher questionnaires in approximately 30 minutes.

I understand that all data will be kept confidential and that the names of participants will not be used in any published work. I can withdraw from the study at any time without any consequence, and that the deadline date for requesting withdrawal from the study is June 4, 2016.

I understand that there are no known risks, discomforts or inconveniences involved in the study. I understand that this consent is for March-June 2016 period only

I understand that the plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, I can contact the Research Ethics Office at (780) 492-2615. For any other questions, concerns or complaints that I may have, I can contact the research supervisor Dr. Rauno Parrila at (+1)780-492-3696 (rauno.parrila@ualberta.ca), or Jeongsuk Jang at (+1) 587-778-6630 (Canada) and (+82) 010-3606-4692 (South Korea) (jeongsuk@ualberta.ca).

_____I consent that I participate

_____I do not consent that I participate.

Name of teacher:_____

Signature: _____

Date: _____

D.3. Parent(s)/Guardian (s) Letter of Information

Dear parent(s)/guardian(s),

You and your child are invited to participate in my research study called *Factors affecting Academic Achievement of North Korean students in South Korean School.* I, Jeongsuk Jang, am a graduate student in the Department of Educational Psychology, University of Alberta, Canada, and I am doing this study for my PhD Degree under the supervision of Professor Rauno Parrila. Please carefully read the information on the study below.

Background

The migration of North Korean defectors to South Korea has increased dramatically in the last two decades. As women make up the majority of defectors, the number of children and youth who are brought directly from North Korea, or who were born in other countries, continues to increase. To find a more durable humanitarian solution for North Korean students in South Korean schools, the South Korean government has offered them educational services and programs since 2009. However, North Korean students who attend schools in South Korea generally tend to lag behind and often fail to catch up with their South Korean peers, and the academic gap between North and South Korean students has continued to widen. This may also explain why students from the North have higher school dropout rates. However, no research has yet addressed the specific factors that explain the academic underachievement of North Korean students, which may relate to both psychological and social factors.

The Study

The present study will seek to address this gap by examining the link between social and psychological factors and poor educational outcomes. It will include two studies. Study 1 will investigate psychological factors affecting the achievement gap between North and South Korean students. Study 2 will examine how social factors affect the achievement gap between the two groups of students. The factors on which the studies will focus are students' linguistic and cognitive skills (psychological factors) and students' family background and home literacy practices (social factors).

Participant Involvement

Phase 1. Seventy-five students at each of the elementary and middle school grades targeted (Grades 3-8) will participate in Phase l. Of the total of 450 participants, 150 will be students who moved directly from North Korea to South Korea, 150 will be students who spent significant amount of time in China or other countries on their way to South Korea, and 150 will be students born in South Korea to South Korean parents. Children in each grade will be given an assessment battery consisting of tests of phonological awareness, rapid automatized naming, visual skill, vocabulary, word and pseudoword reading, and reading comprehension. The assessment battery will be administered individually to each student in a quiet classroom in two sessions of roughly 30 minutes each.

Phase 2. One hundred students in each of the elementary and middle school grades targeted (Grades 3-8) will participate in Study 2. Of the total of 600 participants, 300 will be

from North Korean heritage and born in South Korea to South Korean parents. Parents/guardians and teachers of the students will also be asked to fill out questionnaires. The student questionnaires will be administered in groups of approximately 10 students during class time in the schools on a schedule that will be provided by school principals. Each student will be asked to complete the questionnaires in approximately 30 minutes in the presence of the researcher or a research assistant. The parent/guardian questionnaires will be sent to home with the student on a single occasion. The teacher questionnaires will be administered in the classrooms in the presence of the researcher or a research assistant.

What we promise

Each phase will only begin with the consent of you and your child to take part and you and your child may decide to end participation in the study at any time. Name of children and their parents/guardians will not be used in my dissertation or in any published work. I will take notes on how the child performs the reading activities and may record the time he/she takes to complete a task. The activities are like everyday classroom activities and there are no known risks or discomfort involved in any of these activities. The results will not have any effect upon your child's grades. I will do my best to ensure that your child will enjoy the activities. The protection of the privacy of you and your child who participate in this study is very important to us. Therefore, all data will be kept in a locked drawer at the University of Alberta and only I will have access to the full data.

I may share the overall description of how children perform with your child's classroom teacher, but I will provide the details about your child only to you. A short report on how your child has done in these activities can be provided to you upon your request. I will use the full data in my dissertation and research papers. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (+1) 780-492-2615.

I appreciate your support for my research. If you have any questions about this study, please contact my research supervisor, Dr. Rauno Parrila at (+1) 780-492-3696 (rauno.parrila@ualberta.ca), or me at (+82) 010-3606-4692 (South Korea), (+1) 587-778-6630 (Canada) (jeongsuk@ualberta.ca).In order for you and your child to participate in the project, please complete and return the attached form to me. If you and your child decide to withdraw yourself and your child from the project, you and your child can do so without having to provide any explanation. The deadline date for requesting withdrawal from the study is June 4, 2016.

Thank you very much for your help.

Yours sincerely,

Jeongsuk Jang
Department of Educational Psychology
University of Alberta, CANADA

Research Study Consent Form (Parent/Guardian)

You are making a decision about whether or not to participate and to have your child participate in this study. Your signature indicate that you have decided to participate and to allow your child to participate, that you have read the information provided in this consent form and that you have received a copy of it.

____ I understand that I and my child will participate in this study in March to June 2016

____ I understand these activities will only begin and continue as long as children and their parents/guardians are interested.

____ I understand that there are no known risks, discomforts or inconveniences involved in the study.

____ I understand that all data will be kept confidential and that the names of participants will not be used in any published work.

____ I and my child can withdraw from the study at any time without any consequence.

____ I understand that the deadline date for requesting withdrawal from the study is June 4, 2016.

____ I understand that this consent is for March-June 2016 period only

____ I understand that the overall description of how my child perform might be shared with my child's classroom teacher, but the details about my child's performance will be provided only to me.

I _____(name of parent/guardian) consent that I take part.

My child _____(name of child) has agreed to participate in research.

Parent Signature: _____ Date:_____

Appendix E

E.1. Student Questionnaire on Home Literacy Practices

The following survey is designed to gain a better understanding of home literacy practices. It is divided into five parts, dealing with reading practices, talking about reading, talking about schoolwork, use of digital devices, and after-school tutoring. For each question, please choose the response that best describes your literacy practices.

Part 1. Reading Practices

The following questions focus on your reading habits. They consider three kinds of reading materials: books, magazines and newspapers, and online digital texts.

Books

Note. The books referred to below include those in three types of formats−paper books, eBooks, and audiobooks.

How many hours *per day* do you read books outside of school during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

How many hours *per day* do you read books during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

How many of your own books do you have in your home?

None *1-20* *21-60* *61-150* *More than 150*

Do you own a public library card? *No* *Yes*

How often do you visit your public library during the school year?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you visit your public library during the vacations?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How many public library books *per month* do you borrow during the school year?

None *1-5* *5-10* *10-20* *More than 20*

How many public library books *per month* do you borrow during the vacations?

None *1-5* *5-10* *10-20* *More than 20*

How often do you look for books in bookstores during the school year?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you look for books in bookstores during the vacations?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you look for books in online bookstores (e.g., Kindle and the App Store on iTunes) during the school year?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you look for books in online bookstores during the vacations?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

Magazines & Newspapers

Note. The magazines and newspapers referred to below include those in both paper and online digital formats.

How many hours *per week* do you read magazines during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

How many hours *per week* do you read magazines during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

How many hours *per week* do you read newspapers during the school year?

Zero	*½ hour*	*1 hour*	*1 ½ hours*	*2 hours or more*

How many hours *per week* do you read newspapers during the vacations?

Zero	*½ hour*	*1 hour*	*1 ½ hours*	*2 hours or more*

Online Digital Texts

Note. The online digital texts include all the written work you can find on the internet or on your computer or on a variety of hand-held electronic devices, other than eBooks and digital magazines and newspapers mentioned above.

How many hours *per day* do you read digital texts (e.g., Facebook, webtoons, blogs, etc.) during the school year?

Zero	*½ hour*	*1 hour*	*1 ½ hours*	*2 hours or more*

How many hours *per day* do you read digital texts during the vacations?

Zero	*½ hour*	*1 hour*	*1 ½ hours*	*2 hours or more*

Part 2. Talking about Reading

The following questions seek to understand how often you talk about reading with friends and family.

How often does/do your parent(s)/guardian(s) show interest in what you read?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you discuss what you read with your parent(s)/guardian(s) or other family members?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you discuss what you read with your friends?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you discuss what you read with other people (e.g., private instructors, mentors, etc.)?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

Part 3. Talking about Schoolwork

The next questions examine how often you interact with your parent(s)/guardian(s) about your schoolwork.

How often does/do your parent(s)/guardian(s) help you with your homework?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you have a conversation with your parent(s)/guardian(s) about what happened in school (e.g., participating in group lessons, asking questions in your classroom, and helping other students)?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you have a conversation with your parent(s)/guardian(s) about what you learned in school?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you have a conversation with your parent(s)/guardian(s) about your academic progress?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How often do you have a conversation with your parent(s)/guardian(s) about strategies for increasing academic achievement?

Never	*About once*	*A few times*	*A few times*	*Daily*

per month *per month* *per week*

Part 4. Use of Digital Devices

The next group of questions is designed to find out about your access to digital resources.

Do you have your own computers (e.g., desktops or laptops), tablets (e.g., iPads), or mobile devices (e.g., iPods, electronic books readers or MP3 players) in your home? *No* *Yes*

If *Yes*, please mark all boxes that apply.

Device	
Desktop	
Laptop	
Tablet (e.g., iPad, Samsung GALAXY Tab/Note)	
MP3 player	
iPod (GALAXY player)	
Electronic book reader	
Smartphone	
Others (please specify)	

Do you have access to the internet in your home? *No* *Yes*

On average, how many hours *per day* do you spend on the internet in your home during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

On average, how many hours *per day* do you spend on the internet in your home during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you utilize online educational resources during the school year? *No* *Yes*

If *Yes*, please mark all boxes that apply.

Resources	
Textbooks	
Video lessons/tutorials	
Foreign language lessons	
Test prep materials	

YouTube channels	
Web resources in academic subjects	
Educational apps/games/websites	
Others (please specify)	

How many hours *per day* do you utilize online educational resources during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you utilize online educational resources during the vacations? *No* *Yes*

If *Yes*, please mark all boxes that apply.

Resources	
Textbooks	
Video lessons/tutorials	
Foreign language lessons	
Test prep materials	
YouTube channels	
Web resources in academic subjects	
Educational apps/games/websites	
Others (please, specify)	

How many hours *per day* do you utilize online educational resources during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

On average, how many hours *per day* do you spend in front of a screen (e.g., playing video games, watching non-educational TV programming, surfing the web, or texting or chatting on your smartphones) during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

On average, how many hours *per day* do you spend in front of a screen during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

To how many hours *per day* does/do your parent(s)/guardian(s) limit your total screen time during the school year?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

To how many hours *per day* does/do your parent(s)/guardian(s) limit your total screen time during the vacations?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Part 5. After-School Learning

The last group of questions focuses on the types of after-school learning activities in which you are involved. These may include private after-school tutoring academies (called *Hagwons)*, private one-to-one tutoring, regional community Children's center, and one-to-one mentoring programs.

Do you attend Hagwons for academic subjects during the school year? *No* *Yes*

If *yes*,
For what subjects do you attend the Hagwons (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per day* do you spend in the Hagwons during the school year?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you attend Hagwons for academic subjects during the vacations? *No* *Yes*

If *yes*,
For what subjects do you attend the Hagwons (please, mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	

Korean language	
Others (please specify)	

How many hours *per day* do you spend in the Hagwons during the vacations?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you receive private one-to-one tutoring for academic subjects during the school year?

No *Yes*

If *yes*,

For what subjects do you receive the tutoring (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per week* do you receive the tutoring during the school year?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you receive private one-to-one tutoring for academic subjects during the vacations? *No* *Yes*

If *yes*,

For what subjects do you receive the tutoring (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per week* do you receive the tutoring during the vacations?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you attend a regional community Children's center, which is operated by the Ministry of Health and Welfare, for academic subjects during the school year? *No* *Yes*

If *yes,*
For what subjects do you attend the center (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per day* do you spend in the center during the school year?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you attend a regional community Children's center for academic subjects during the vacations?

No *Yes*

If *yes,*
For what subjects do you attend the center (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per day* do you spend in the center during the vacations?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you participant in a one-to-one mentoring program for academic subjects during the school year? *No* *Yes*

If *yes*,
In what subjects do you receive the mentoring (please mark all boxes that apply)?

Subject	

Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per week* do you participate in the program during the school year?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you participate in a one-to-one mentoring program for academic subjects during the vacations?

No *Yes*

If *yes*,

In what subjects do you receive the mentoring (please mark all boxes that apply)?

Subject	
Mathematics	
English	
Science	
Social studies	
Korean language	
Others (please specify)	

How many hours *per week* do you participate in the program during the vacations?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you attend nonacademic Hagwons (e.g., for piano lessons, art lessons, swimming, and taekwondo) during the school year? *No* *Yes*

If *yes*,

For what nonacademic activities do you attend the Hagwons (please mark all boxes that apply)?

Nonacademic activity	
Music	
Arts	
Sports	
Others (please specify)	

How many hours *per week* do you spend in the Hagwons doing these activities during the school year*?*

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you attend nonacademic Hagwons during the vacations? *No* *Yes*

If *yes*,
For what nonacademic activities do you attend the Hagwons (please mark all boxes that apply)?

Nonacademic activity	
Music	
Arts	
Sports	
Others (please specify)	

How many hours *per week* do you spend in the Hagwons doing these activities during the vacations*?*

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you receive private one-to-one tutoring for nonacademic activities during the school year?

No *Yes*

If *yes*,
For what nonacademic activities do you receive the tutoring (please mark all boxes that apply)?

Nonacademic activity	
Music	
Arts	
Sports	
Others (please specify)	

How many hours *per week* do you spend receiving tutoring in these activities during the school year?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Do you receive private one-to-one tutoring for nonacademic activities during the vacations?

No *Yes*

If *yes*,
For what nonacademic activities do you receive the tutoring (please mark all boxes that apply)?

Nonacademic subject area	
Music	
Arts	
Sports	
Others (please specify)	

How many hours *per week* do you spend receiving tutoring in these activities during the vacations?

1 hour or less *2-3 hours* *3-4 hours* *4-5 hours* *5 hours or more*

Thank you!

E. 2. Parent/Guardian Questionnaire on Home Literacy Practices

The following survey is designed to gain a better understanding of home literacy practices for your child. It is divided into four parts, the first three focusing on how you read and discuss reading and schoolwork with your child. The last section deals with use digital devices. For each question, please choose the response that best describes your literacy practices.

Part 1. Reading Practices

The following questions focus on your reading habits. They consider three kinds of reading materials: books, magazines and newspapers, and online digital texts.

Books

Note. The books referred to below include those in three types of formats−paper books, eBooks, and audiobooks.

How many hours *per week* do you read books?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

How many of your own books do you have in your home?

Less 100 *100-299* *300-499* *500-1000* *More than 1000*

How much money *per month* do you spend on your own books?

$15 or less *$15-30* *$30-45* *$45-60* *$60 or more*

How much money *per month* do you spend on your child's books?

$15 or less *$15-30* *$30-45* *$45-60* *$60 or more*

Do you own a public library card? *No* *Yes*

How often do you visit your public library?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

How many public library books *per month* do you borrow for yourself?

None *1-5* *5-10* *10-20* *More than 20*

How often do you look for books in local or online bookstores?

Never	*About once per month*	*A few times per month*	*A few times per week*	*Daily*

Magazines & Newspapers

Note. The magazines and newspapers referred to below include those in both text and digital formats.

How many hours *per week* do you read magazines?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you subscribe to a magazine? *No* *Yes*

How many hours *per week* do you read newspapers?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you subscribe to a newspaper? *No* *Yes*

Online Digital Texts

Note. The online digital texts include all the written work you can find on the internet or on your computer or on a variety of hand-held electronic devices, other than eBooks and digital magazines and newspapers mentioned above.

How many hours *per week* do you read digital texts (e.g., Facebook, webtoons, blogs, etc.)?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Part 2. Talking about Reading

The following questions seek to understand how often you talk about reading with your child.

How often do you ask your child what he/she is reading?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you discuss with your child what he/she reads?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

Part 3. Talking about Schoolwork

The next questions examine how often you interact with your child regarding his/her schoolwork.

How often do you help your child with his/her homework?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you have a conversation with your child about what happened in school (e.g., participating in group lessons, asking questions in his/her classroom, and helping other students)?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you have a conversation with your child about what he/she learned in school?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you have a conversation with your child about his/her academic progress?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

How often do you have a conversation with your child about strategies for enhancing his/her academic achievement?

Never *About once per month* *A few times per month* *A few times per week* *Daily*

Part 4. Use of Digital Devices

The next group of questions is designed to find out about your access to digital resources.

Do you have your own computers (e.g., desktops or laptops), tablets (e.g., iPads), or mobile devices (e.g., iPods, electronic book readers or MP3 players) in your home? *No* *Yes*

If *Yes*, please mark all boxes that apply.

Device	
Desktop	
Laptop	
Tablet (e.g., iPad, Samsung GALAXY Tab/Note)	
MP3 player	
iPod (GALAXY player)	
Electronic book reader	
Smartphone	
Others (please specify)	

Do you have access to the internet in your home? *No* *Yes*

On average, how many hours *per day* do you spend on the internet in your home?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

On average, how many hours *per day* does your child spend on the internet in your home?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you and your child utilize online educational resources together? *No* *Yes*

If *Yes*, please mark all boxes that apply.

Resources	
Textbooks	
Video lessons/tutorials	
Foreign language lessons	
Test prep materials	
YouTube channels	
Web resources in academic subjects	
Educational apps/games/websites	
Others (please specify)	

How many hours *per day* do you and your child utilize online educational resources?

Zero *½ hour* *1 hour* *1 ½ hours* *2 hours or more*

Do you limit your child's screen time? *No* *Yes*

E. 3. Teacher Questionnaire on Student Academic Achievement

The following survey is designed to promote a better understanding of student academic achievement in schools. It involves students' performance in specific academic subject areas and overall academic performance. For each question, please choose the response that best describes your student's academic performance.

How is the student performing in Korean language?

Poor *Fair* *Good* *Very good* *Excellent*

How is the student performing in Mathematics?

Poor *Fair* *Good* *Very good* *Excellent*

How is the student performing in English?

Poor *Fair* *Good* *Very good* *Excellent*

How is the student performing in Science?

Poor *Fair* *Good* *Very good* *Excellent*

How is the student performing in Social Studies?

Poor *Fair* *Good* *Very good* *Excellent*

What is the overall academic performance of the student?

Poor *Fair* *Good* *Very good* *Excellent*

Thank you!