SECOND DIALECT ACQUISITION OF NORTH KOREAN REFUGEES IN SEOUL

by

JUNGAH LEE

A DISSERTATION

Presented to the Department of East Asian Languages and Literature
and the Division of Graduate Studies of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

June 2022

DISSERTATION APPROVAL PAGE

Student: Jungah Lee

Title: Second Dialect Acquisition of North Korean Refugees in Seoul

This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the Department of East Asian Languages and Literature by:

Kaori Idemaru	Chairperson
Charlotte Vaughn	Core Member
Nayoung Kwon	Core Member
Volya Kapatsinski	Institutional Representative

and

Krista Chronister	Vice Provost for Graduate Studies

Original approval signatures are on file with the University of Oregon Division of Graduate Studies.

Degree awarded June 2022

DISSERTATION ABSTRACT

Jungah Lee

Doctor of Philosophy

Department of East Asian Languages and Literature

June 2022

Title: Second Dialect Acquisition of North Korean Refugees in Seoul

The current study examines second dialect acquisition of North Korean refugees living in Seoul. A total of 14478 stops were measured from each of 22 Pyongyang North Korean standard (NK) and Seoul South Korean (SK) speakers. First, stops of NK and SK have been directly compared to each other by measuring VOT, F0, and H1-H2. In addition to providing acoustic analyses of stop production in NK and SK, effects of various sociolinguistic factors on stop production have been statistically investigated. Moreover, topic-based style shift and interlocutor effects on their production have examined.

First, NK and SK stops were significantly different in terms of VOT and F0. The NK speakers still primarily rely on VOT as a cue to distinguish the stops, unlike the SK speakers. In addition, three different speech conditions significantly influenced the NKs' stop production. Specifically, in reading nonce word task, the NK speakers produced more NK-like stops. However, in a conversation with a SK interviewer, they produced more SK-like stops. Acquisition of SK stops were also significantly related to sociolinguistic factors. Other than age of acquisition and length of residence in Seoul, Identification and Language attitudes were significant predictors in producing SK-like

stops. The more they identified themselves as South Korean, the more they produced SK-like VOT patterns. Moreover, the more positive attitudes they expressed towards SK, the better they produced SK-like F0 patterns. Topic-based style shift of NK speakers was also uncovered. Topic itself did not influence the NKs' stop shifting; however, topic x stance effects significantly affected their stop production. When they talked about North Korea negatively, they performed SK identity, by producing more SK-like stops. Finally, interlocutor effects were also significant. With the SK interviewer, they used clear speech strategy, by enhancing both VOT and F0 cue in stop production. In contrast, with the NK interviewer, their VOT and F0 were less differentiated, showing more casual stop production. This study highlights the process of acquiring new manner of stops in SK and predictors that influence better SK stop production, by providing speech data from more vulnerable and marginalized population in a society.

CURRICULUM VITAE

NAME OF AUTHOR: Jungah Lee

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene
University of Lancaster, U.K.
Hankuk University of Foreign Studies, Seoul

DEGREES AWARDED:

Doctor of Philosophy, East Asian Linguistics, 2022, University of Oregon
Master of Arts, Linguistics and English Language, 2016, University of Lancaster
Bachelor of Arts, Korean Education and English Linguistics, 2013, Hankuk University of Foreign Studies

AREAS OF SPECIAL INTEREST:

Korean linguistics, Phonetics, Sociolinguistics, Sociophonetics, Speech Production and Perception, Second Dialect Acquisition

PROFESSIONAL EXPERIENCE:

Graduate Employee, University of Oregon, 2017 ~ 2022

Data Analyst, Monash University, 2021

Research Assistant, University of Lancaster, 2015 ~ 2016

English Teacher, Changmun Girls' High School, 2014 ~ 2015

English Teacher, Jangsu Middle School, 2013 ~ 2014

GRANTS, AWARDS, AND HONORS:

Student Award, Production and Perception of North Korean and South Korean Vowels, International Congress of Phonetic Science, 2019

The Best Paper Award, Phonetic Differences Between North and South Korean, School of Pacific and Asian Studies 2018, Graduate Student Conference, University of Hawaii of Manoa, 2018

Graduate Teaching Fellow Federation Funding, University of Oregon, 2021

Graduate Teaching Fellow Federation Funding, University of Oregon, 2020

Summer Research Funding for Graduate Students, University of Oregon, 2019

Research Travel Grant in Center of Asian and Pacific Studies, University of Oregon, 2019

Student Award Traveling Funding, International Congress of Phonetic Science, 2019

Research Travel Grant in Department of East Asian Languages and Literature, University of Oregon, 2018

[HUFS Welfare Scholarship, Hankuk University of Foreign Studies, 2008 ~ 2013, (For 5 years, all semesters]

PUBLICATIONS:

Lee, J., Vaughn, C., Idemaru, K. (2019) Production and perception of North Korean and South Korean Vowels: A pilot study. International Congress of Phonetic Science 2019

Lee, J., Idemaru, K., Vaughn, C. (2018) Comparative analysis of South Korean and North Korean vowels: A pilot study. Acoustic Society of America 2018, Victoria.

ACKNOWLEDGMENTS

I want to express my sincere appreciation to my committee members, Professors Kaori Idemaru, Charlotte Vaughn, Nayoung Kwon, and Volya Kapatsinski for their assistance and support during the last five years. Specifically, I want to thank Professors Idemaru and Vaughn for their guidance and advice. I have grown so much in the last five years both academically and personally. They have raised and advised me to be a more competent and mature researcher in the phonetics field. Thank you again for not losing faith in me, not giving up on me, and nurturing the immature first year of PhD student. Now the immature freshman has turned to more capable grown-up. I also would like to thank Prof. Kapatsinski for helping me statistical methodologies. I have learned a lot from you and am touched by your patience and kind advice for statistics. I also want to thank Prof. Kwon for helpful comments.

I owe a deep sense of gratitude to Dr. Nam, the president of the Korean Association of International Studies, and Ms. Cho, the vice-president of school for North Korean refugees. Without their help, I would not have been able to find North Korean speakers and build strong connections with the North Korean speakers. Thank you again for creating my connection with North Korean refugees.

I also thank all of my North and South Korean participants who made this study happen. Specifically, I would like to express my deep and sincere appreciation to my North Korean friends, who always welcome me and helped me finish this dissertation. They accept me, a South Korean stranger, as an in-group member in their community. Even when I asked them for additional recording for the speech production between NK

speakers, they were so willing to help me and introduce me to their NK friends. Thank you again for the kindest act and providing speech production for my disseration.

I deeply appreciate my parents, brother, and Laura for their constant encouragement and financial support during my PhD years. Five years of PhD were not short but very demanding mentally, physically, and financially. Thanks to all the support from my family, I could handle stress and frustration well, and achieve academic success in PhD program.

I am also very fortunate to have had support from my friends, Steffi Hung, Dr. Jun Lang, and Carissa Diantoro. At University of Oregon, through true friendship, support, and encouragement, I could enjoy research and become an emotionally stable grown-up. Thank you all! I will never forget you and wish you all the good lucks for the rest of your life.

Dedicated to my grandmother and Laura in heaven

TABLE OF CONTENTS

LIST OF FIGURES

Figure Page

LIST OF TABLES

Chapter I. Background

Although North and South Korean language are mutually intelligible and use the same Korean alphabet, called “Hangeul”, linguistic divergence between the two countries has been observed. 71 years of territory separation and different language policy have been considered the primary factors of this linguistic divergence (Sohn, 2001). This study focuses on how Pyongyang standard North Korean (NK) refugee speakers (NK speakers) living in Seoul acquire Seoul standard Korean (SK) stop production from the perspective of second dialect acquisition. First, I provide the background on separation between the two countries. Next, I will describe language policies in North and South Korea and how they work as a main trigger of the drastic linguistic divergence between the two countries. In addition, phonetic differences between North and South Korean are reviewed. Among the various phonetic differences, motivation behind looking at stops is discussed. Finally, an overview of this dissertation is presented. Previous frameworks within the field of second dialect acquisition while examining factors that may predict geographically mobile speakers’ successful acquisition of second dialect will be described.

1.1. Separation of NK and SK

To understand second dialect acquisition of NK speakers in SK, it is important to understand historical background such as how and why the two Koreas are separated. The two Koreas are now considered two different countries. However, it was once a united country before 1950. From 1910 to 1945, Korea was colonized by Japan (Cumings, 2010). During the thirty-five years of colonial rule, three million people tried to fight

tooth and nail against Japanese occupation (Ministry of Patriots and Veterans Affairs, 2019). While they enlightened citizens and carried on an independence movement, they were split into two groups, liberalism, and socialism (later, communism) (Cumings, 2010). After thirty-five years of Japanese occupation, Koreans finally achieved liberation in 1945. However, before Koreans tasted freedom and independence enough, the ideological conflicts between liberalism and communism deteriorated the peace. As a result, the 38th parallel was drawn across the middle of country. The Soviet Union occupied the north of 38th and the United States ruled south of 38th. Although Kim Gu, an independence activist and premier of Provisional Government of the Republic of Korea, strongly insisted 'one united Korea', in 1948, the Democratic People's of Republic of Korea was established by Kim Il Sung in the North based on communism ideology. In the South, rooted in democracy and liberalism, Lee Seung Man became the first president in Republic of Korea. After a year, Kim Gu was assassinated (Jung, 2006) and tension between two governments and ideologies escalated. In 1949, Kim Il Sung crossed the 38th parallel to take over the South and triggered the Korean war (Park, 2008). The Korean War broke out from 1950 to 1953. After the tragedy of killing the same Koreans and losing countless innocent lives, two countries agreed to a ceasefire in July 1953 and now they have been separated for over seventy years (Park, 2008).

1.2. Linguistic differences between NK and SK

For the last seven decades, the two Koreas have forged their own paths apart. North Korea is governed under Kim's family, but South Korea achieved democracy after fighting against dictatorship from 1953 to 1988. Linguistic divergence between North and

South Korea occurred due to the physical division of territory, the polarized political, ideological, and social separation, and different language policies. This section presents how language policies in the two countries have changed after the war and triggered drastic language divergence between two countries.

As introduced in the first section, Korea was colonized by Japan between 1910 and 1945, and some of the earlier movements toward language standardization occurred in response to the Japanese colonization. In 1933, the implementation of standard language policy was first discussed before the separation of territory between the two countries (Korean Language Association, 1933). The Unification Proposal for Hangeul Spelling officially regulated Korean standard language (Korean Language Association, 1933), and stated, "the standard language shall by and large be the speech used in middle class society in present-day Seoul" (Korean Language Association, 1933). After the Korean war ended in 1953, Kim Il Sung, the first leader of North Korea, abolished this definition for his country and changed the definition of standard language in North Korea (Linguistic Institute, Academy of Social Sciences, 1954, Sohn, 2001). The old definition was based on spoken language in Seoul, and Kim Il Sung considered that 'middle class' in the definition was against proletariat spirit (Linguistic Institute, Academy of Social Sciences, 1954). This, he wanted to define new standard language rooted in Pyongyang and communism (Yim, 1979).

Kim Il Sung made the North Korean official language serve the needs of the emerging socialist state (Linguistic Institute, Academy of Social Sciences, 1976; 1973). He had striven to implement socialist policy, as well as shape the thinking and behavior of the populace (Kaplan & Baldauf, 2011). According to Yim (1979), he tried to

represent the will of the party to the citizenry through language. In other words, Kim tried to make North Korean language fit its communist ideology (Sohn, 2001). According to Linguistic Institute, Academy of Social Sciences (1973; 1966; 1954), Kim deemed Pyongyang North Korean standard language "Cultured language". This "Cultured language" was defined as:

> "the richly developed national language that is formed centering on the revolutionary capital under the leadership of the proletariat party that holds sovereignty during the socialism-constructing period, and that all people hold as a standard because it has been refined revolutionarily and polished culturally to fit the proletariat's goals and lifestyle" (Linguistic Institute, Academy of Social Sciences, 1973, p 19).

At the same time, Kim banned Chinese characters, claiming that their elimination would increase literacy; eliminated expressions associated with the Japanese colonial period; and prohibited the usage of South Korean Language, claiming that it is full of foreign influence and sexism (Linguistic Institute, Academy of Social Sciences, 1973). In general, North Korea created language policies that was cleansed of foreign influences as well as encouraged communist ideology.

In South Korea, the previously given definition of standard speech by the Korean Language Association (1933) was kept until 1987. In 1988, however, the term 'middle class' was replaced with 'people with education'. In other words, standard language became "the language [that] shall in principle be defined as the speech widely used by people with education in present-day Seoul" (Ministry of Education, 1988, p 5). In contrast to North Korea, South Korea did not fully eliminate Chinese characters until

1994 (Park & Kwon, 2003). In addition, South Korea was more open than North Korea to non-native words; the country has actively accepted foreign and loan words as well as neologisms. As a result, in South Korea, using foreign words and loan words has become common (Choi, 2006). While openly accepting foreign and loan words, the South Korean government abrogated communism-related expressions such as *tongmwu*: comrade, *phulolleythallia*: proletariat, and *notongca*: laborer. It also eradicated /r/ addition rules in the word initial position in order to separate itself from North Korea, where the word initial /r/ is observed (Yeon, 2006; Song, 2006).

Geo-political separation can lead languages that were originally the same to diverge along geological boundaries. In addition, different language policies may cause linguistic divergence between two countries. The geo-political separation of South and North Korea, as well as drastically different language policies of the two countries likely affected the divergence of the South Korean and the North Korean languages. In addition to lexical, morphological and syntactic domains, South and North Korean languages differ in phonetics as well.

1.2.1. Overview of Phonetic differences between South Korean and North Korean

In terms of phonetic differences between SK and NK, previous literature has reported that phonetic differences were primarily found in producing cardinal vowels, affricates, and stops. I will review SK research that examines Seoul standard language. However, in terms of NK research, because the research on North Korean speakers is very scarce, I will include research that examined NK speakers from dialect areas outside the capital, Pyongyang.

The traditional analysis of SK vowels included ten vowels, which were [i], [e], [æ], [ɯ], [ʌ], [u], [o], [a], [y], and [ø] (Sin et al., 2012; National Institute of Korean Language, 2011; Ministry of Education in Korea, 2007). However, later studies have revealed that [y] and [ø] had diphthongized to [wi] and [we], respectively (Eychenne &Jang, 2015; Sin et al., 2012). In addition, [e] and [æ] have merged into [ɛ] (Jang et al., 2015; Sin et al., 2012). Thus, now the SK vowel system has seven cardinal vowels: [i], [ɛ], [ɯ], [ʌ], [u], [o], and [a] (Lee & Ko, 2016; Sin et al., 2012). The vowel inventory of SK is shown below.

Table 1.1 Inventory of monophthongs in SK (Sin et al., 2012)

	Front	Back	
	Unrounded	Unrounded	Rounded
High	i	ɯ	u
Mid	ɛ	ʌ	o
Low		a	

Besides the [e]-[æ] merger in SK, [o]-[u] approximation in production has also been reported since around 2000. More specifically, [o] has raised to the position of [u] decreasing dramatically the distance between [o] and [u] (Han & Kang, 2013; Jang & Shin, 2006; Seong, 2004). According to Seong (2004), before late 1990, the distinction between [o] and [u] was clear. The [o] vowel was in a mid-back position and the [u] vowel was in a high back position (Han & Kang, 2013; Jang & Shin, 2006; Chae, 1999). However, researchers have reported that younger female speakers started to show approximated [o]-[u] in their production from early 2000 (Han & Kang, 2013; Seong,

2004). Previous research argues that this recent approximation has occurred due to language contact (Kang, 2003; Kang, 1996). More specifically, they argue that recent loanwords containing [oʊ] such as 'boat' and 'note' in English affect the approximation of [o] and [u] (Han & Kang, 2013; Jang & Shin, 2006).

In NK research, Lee (1991) was one of the first to study phonetics in NK with descriptive studies. He argued that monophthongs in NK still have ten vowels ([i], [æ], [e], [ɯ], [ʌ], [o], [ø], [y], [u], [o], [a]). As noted above, the number of SK monophthongs has changed from ten to seven due to the diphthongization and [æ]-[e] merger into [ɛ]. In contrast, according to Lee (1991), the NK monophthongs still include four vowels ([ø], [y], [æ], and [e]) that were only part of the SK inventory in the past. In a later study, similarly, Lee and Ramsey (2000) argued that [ø] and [y] are still monophthongs in Hwanghae dialects of North Korea which is in the Southern western province of North Korea. This seems to suggest that the NK has preserved the old vowel systems of the 20th century that were examined by the Korean Language Association (1933) before the war. However, considering the year of publication (Lee & Ramsey, 2000; Lee, 1991), and the fact that there were no acoustic data in their studies, it is unknown whether vowel sounds of NK monophthongs have changed. Even if it went through changes, it is hard to know when the changes may have been occurred specifically (Lee, 1991).

Vowels are typically described in terms of vowel height, backness, and lip rounding. However, in Lee (1991)'s description of NK, vowels are classified with four different parameters of tongue placement. In addition to the height and backness, the end of the tongue tip is included. Specifically, vowels are classified with *kkuthmoum*: end of tongue tip, *aphmoum*: tongue in front, *kawunteymoum*: tongue in middle, and *twimoum*: tongue

in back of articulator. In addition, NK vowels are sorted by shape of mouth and height of tongue. They have named unrounding vowels as *kilccukmoum*: flat vowels and rounding vowels as *twungkunmoum*: round vowels (Lee, 1991). In terms of vowels with tongue height, they do not have mid vowels but only have high and low vowels (Lee, 1991). The vowel inventory of NK is shown below.

Table 1.2. Vowel inventory of NK (Lee, 1991)

	End of tongue tip	Front		Center	Back	
	Flat	Flat	Round	Flat	Flat	Round
high	[i]	[e]	[y]	[ɯ]	[ʌ]	[u]
low		[æ]	[ø]		[a]	[o]

Different from SK vowels, it is notable that, in NK, [ʌ] is a high back vowel. In SK, [ʌ] is a mid-back vowel. I note that if this description is accurate, NK has a very crowded vowel space for high vowels. I wonder whether some of these vowels might actually be mid vowels. Lee (1990, 1991) claimed that the center vowel [ɯ] and [ʌ] have converged to [u] and [o], respectively, in NK. Similarly, Kang (1996, 1997, 1999a; 1999b) also reported that back vowels [ʌ] merged to [o] and [ɯ] merged to [u] in NK, Hamkyong, Northern eastern province of North Korea, and Hwanghae speech. Given that these studies were conducted in 1990s and the data were not statistically analyzed, it might not be easy to claim the results accurately represent NK vowels. However, these findings have been consistently shown in more recent studies.

Morgan (2015) analyzed NK and SK vowels using speech data in movies filmed between 1950 and 2010. She showed significant vowel shifts in both countries. Right after the war, in the 1950s, the NK [ʌ] was in a similar position to SK [ʌ]. However, it rose to a position similar to the NK [o] in 1980. In addition, [u] has shifted to the position of [ɯ]. In females' speech in 2010, [ʌ] rose and moved backward to the same place as [u], and [u] has shifted to [ɯ]. However, in SK, this [ʌ]-[o] shift is not observed. Rather, after 1950s, SK [ʌ] slightly rose to a position alongside [o] but [ʌ] was lowered and backed till 2010. Instead of [ʌ]-[o] merger, [e] and [æ] have gradually merged to [ɛ] in SK (as noted in a paragraph above).

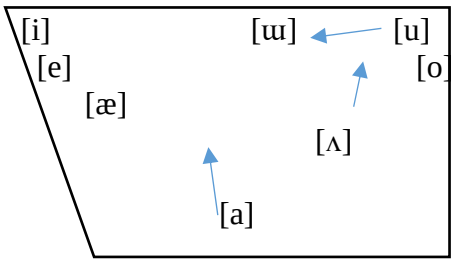


Figure 1.2.1. Vowel Chart 1: North Korean vowel shifts from 1950 to 2010

Morgan (2015) provided diachronic changes in vowel production; however, the production was from movies in North and South Korea. More recently, Kang and Yun (2018) investigated North Hamkyong North Korean (see **Figure 1**) vowels in reading word condition. They analyzed vowels produced by NK defectors living in Seoul who fled Hamkyong providence in NK and compared them to SK vowels. They reported that Hamkyong NK defector speakers' [ɯ] was articulated in a higher and more backed position than the SK [ɯ]. The Hamkyong [u] was also in a more backed position than SK speakers. In addition, the Hamkyong [ʌ] was produced in a higher and more fronted position than the SK [ʌ]. In contrast, the Hamkyong [o] was in a lower and more fronted position. In other words, while SK [ʌ] was lower and more fronted than [o], the

Hamkyong [ʌ] is higher than [o], showing the reverse position of the vowels across the two languages. Although the SK [e]-[æ] is merged, Kang and Yun (2018)'s analysis showed that Hamkyong speakers distinguished [e]-[æ] in production, unlike SK.

Figure 1.2. Hamkyoung province in North Korean

To sum up, production of vowels has changed over time in both SK and NK. SK has seven cardinal vowels because of the [y] and [ø] diphthongization, the merger of [e]-[æ] (e.g., Sin et al. 2012) and the approximation of [o]-[u] are reported. In contrast, NK may still have ten cardinal vowels including [y] and [ø] and distinguishing [e]-[æ]. Rather, the merger of back vowels ([ʌ]-[o], [ɯ]-[u]) has been observed.

As with vowels, differences in consonants have been also reported in previous research. Previously, other than stops and affricates, phonetic differences in consonant has not been examined. In addition, the research on NK speakers is very scarce. It has little been investigated to compare production of consonants between standard NK and standard SK. Thus, research that examined NK speakers from areas outside the capital is included in this review. First, differences in stops are reviewed and then the section that follows describes the differences in stops between SK and Hamkyong and Yanbian dialect.

The SK stops are produced in bilabial, alveolar, and velar places and have a three-way contrast: lenis [p, t, k], fortis [p*, t*, k*], aspirated [p^h, t^h, k^h], respectively. In word initial positions, the stops are articulated as voiceless sounds, and they were historically distinguished by the duration of VOT. VOT used to be shortest for fortis, medial length for lenis, and longest for aspirated for word initial stops; however, this has changed recently as described in the next paragraph. When the stops are produced in intervocalic positions, the duration of closure becomes different for lenis, fortis, and aspirated sounds. Specifically, the closure is the shortest in lenis stops, while fortis stops have the longest duration, and aspirated stops have an intermediate duration. In addition, different from fortis and aspirated stops, lenis stops are voiced in word medial position (Sin et al., 2012). In word final position, the fortis and aspirated stops are neutralized to their lenis counterparts, [p], [t], and [k], respectively (Sin et al., 2012). In summary, originally, SK stops were only differentiated by VOT duration. However, recent studies indicate that VOT has merged between lenis and aspirated stops.

In the early 20th century before two Koreas were separated, according to Jang (2017), the VOT of lenis and fortis stops was similar to each other and shorter than aspirated stops in Seoul. However, the F0 of lenis was not significantly different from that of aspirated stops in early 20^{th} century. Later, between 1950 and 1991, it was found that SK stops were primarily distinguished by the duration of VOT and the amplitude difference between the first and second harmonics (H1-H2) of the vowels following stops playing a secondary role (Sin et al., 2006; Cho et al., 2002). Fortis stops had the shortest VOT (15ms or shorter) and were associated with the lowest H1-H2 (often reaching negative values, resulting in creaky voice quality in the following vowel), lenis stops had

a longer VOT (between 30ms and 50ms) and positive H1-H2 values, indicating breathiest voice quality, and aspirated stops had the longest VOT duration (between 80ms to 120ms) and positive H1-H2 values, but less breathy than the vowels following lenis stops (Sin et al., 2006; Cho et al., 2002; Han and Weitzman, 1970; Kim, 1965; 1994; Lisker and Abramson, 1964; Silva, 1993). However, recent studies indicate that VOT and H1-H2 are no longer salient cues to distinguish lenis and aspirated stops, especially in productions of younger speakers' conversational speech (Oh & Yang, 2013; Kang & Guion, 2008; Kang & Guion, 2008; Silva 2006a, 2006b). Silva (2006) and other studies in 2000s reported, after around 1992, that younger SK speakers who were born after 1965 did not differentiate VOT and H1-H2 of lenis and aspirated stops (both have VOT between 60ms and 80ms, becoming similar to each other, and both have positive H1-H2) but exclusively distinguished with F0 on the vowel following the lenis and aspirated stops in conversational speech (Oh & Yang, 2013; Kang & Guion, 2009; Kang & Guion, 2008). F0 following fortis and aspirated stops was higher than F0 following lenis stops (Kang and Guion, 2006; Cho et al., 2002; Ahn, 1999; Shimizu, 1996; Kim, 1994). This is critical to distinguish aspirated from lenis since the distinction between the two on the basis of VOT and H1-H2 is now lost. Because fortis stops already have the shortest VOT and negative H1-H2, a tonal distinction between fortis and other two stops seem to be redundant (Kang, 2014). Moreover, F0 does not influence perception of fortis stops, presumably due to the distinctly short VOT and negative H1-H2 of the following vowel in those stops (Kim, 2004). In contrast, perception of lenis and aspirated stops was significantly affected by F0, with higher F0 eliciting more aspirated percepts and lower F0 eliciting more lenis percepts (Kang, 2014; Oh & Yang, 2013; Kang, 2010; Kang &

Guion, 2009; Kang & Guion, 2008; Silva, 2006). Thus, F0 now plays a critical role for distinguishing lenis and aspirated stops in SK, whereas it plays a lesser role for fortis stops.

Thus, lenis stops are now produced with a lower tone and aspirated stops have a higher tone in the vowels following the stops. This pitch distinction has become a major cue to differentiate lenis and aspirated stops in both conversational production and perception (Bang et al., 2018; Kang 2014; Oh, 2011; Kang & Guion, 2008; Kenstowicz & Park, 2006). The similar VOT between lenis and aspirated stops was first observed in young SK female speakers (Kang, 2014; Oh, 2011) and currently, the younger generation in general, regardless of sex, uses pitch as a major cue to distinguish the contrast in conversational speech (Oh et al, 2018). In contrast, older Seoul speakers primarily use the VOT distinction to enhance the three-way stop contrast (Kang & Guion, 2008; Silva, 2006). Thus, the VOT distinction represents an older and more conservative production of stops in SK. However, in careful speech even after the early 1990s, younger SK speakers appear to differentiate both VOT and F0 in stops, indicating the secondary role of VOT in only clear speech (Oh, 2011; Kang & Guion, 2009; Kang & Guion, 2008; Kim, 2004).

In contrast to the vast body of studies on SK stops, no empirical studies have been conducted to examine (standard) NK stops, to my knowledge. Thus, it is unknown whether NK stops have also undergone changes in production and perception. Two stop production studies have been found so far that focus on the Yanbian dialect in China (Oh & Yang, 2013) and Hamkyong dialect in North Korea (Kang & Yun, 2018).

First, the Yanbian dialect is mainly spoken by heritage Koreans (Cosencok, heritage Korean minority in China) in the Pyongbook area of China, which is extremely close to the North Korean border. The Yanbian dialect provides critical linguistic materials since Koreans moved to China in the 19th century, and it is reported that speakers kept conservative norms of the Korean language (Ahn, 2007). While SK is non-tonal except for stops, some of its dialects are tonal in both North and South Korea. For example, in South Korea, Southeastern provinces (e.g. Kyongsang) and Mideastern provinces (e.g. Kangwon) are known as regions of tonal dialects (Sohn, 2001). In North Korea, provinces such as Hamkyong, Kangwon, and Hwanghae have tonal dialects (Ahn, 2007). Previous dialectal studies in South Korea have shown that tonal dialect speakers do not use a pitch cue in stop productions since they are more sensitive to tonal changes (Kenstowicz & Park, 2006). Oh and Yang (2013) predicted that since the Yanbian dialect is tonal, the dialect speakers may show different stop productions. They examined stop productions of Yanbian dialect speakers and reported that VOTs of Yanbian speakers were merged in lenis and fortis stops like the SK patterns in early 20th century (Jang, 2017), rather than in lenis and aspirated as the SK pattern shows. Moreover, their participants used different voice quality, instead of pitch, to differentiate stops. More specifically, Yanbian speakers used creaky voice to produce fortis and breathy voice to produce lenis and aspirated stops. However, according to Kim (2015), Yanbian dialect is not as similar to NK as previously thought. Yanbian dialect is categorized as an independent dialect and is considered different from NK in Korean dialectology (Kim, 2015). Given that Jang (2017) reported that VOT of lenis and fortis was similar before

the separation of territory, it might be possible that the NK speakers produce lenis and fortis with similar VOT.

Kang and Yun (2018) conducted another empirical study to examine acquisition of SK stop productions by thirty-five North Korean refugees from Hamkyong. The results showed that, unlike Seoul speakers, Hamkyong speakers in general distinguished lenis and aspirated stops by VOT duration. However, the study did not investigate acoustic properties of fortis stops and involve pitch analyses of the stop contrasts. Since stop contrasts have tonal distinction in SK, it is critical to examine pitch in order to fully understand NK speakers' acquisition of SK stops.

Although previous studies (Oh & Yang, 2013; Kang & Yun, 2018) have described stop production of NK dialect and dialects near NK, it has not examined standard NK stops and F0 distinction of NK stops. In addition, those studies focused on dialects in northern part of North Korea and Yanbian are in China (Hamkyong and Korean heritage minority town in China near the NK border). In other words, it has not investigated (standard) NK stops in speakers from Pyongan province that includes Pyongyang, where the standard NK is spoken. Kang and Yun (2018) investigated whether NK has also gone through changes like SK as well as acoustic cues of stops in NK. However, it is not clear whether F0 distinctions are also applied in NK stops because they have not examined F0 of NK speakers' stops (Kang & Yun, 2018).

The role of F0 is still unknown in the acquisition of SK variety by NK speakers. It is also unknown whether the recruitment of pitch for stop distinction is specific to SK variety (e.g., Jang, 2011; Sin et al., 2006; Silva, 2006a; Silva, 2006b) or if it has happened to both SK and NK. Given that F0 distinction has been recently applied, up

around 1992, in SK (Silva, 2006) and F0 was not salient in the past (Jang, 2017), NK may not have undergone F0 changes in stops like SK has. In addition, considering that older SK speakers still distinguish VOT rather than F0 as a cue to produce stops and F0 is recently applied in younger SK speakers in Seoul (Silva, 2006), it may be that, in NK, VOT is still an important cue while F0 is not used in stop production, like stop distinction in the early 20th century before the two countries were separated.

Korean consonant inventory includes a few affricates. SK affricates have a three-way contrast, just like stops: lenis [tɕ], aspirated [tɕʰ], and fortis [tɕ*] (Sin et al., 2012). Different from English [tʃ] and [dʒ], the Korean affricates are not produced with the lips protruding, and the tongue touches either the lower teeth or both the lower teeth and lower gums (Sin et al., 2012). The affricates are voiceless word initially, but the lenis affricate sounds are voiced [dʑ or d͡ʒ] in word-medial position. The affricates can only appear in word-initial and medial positions, but I will focus on acoustic features of affricates in word initial position.

Just like stops, SK affricatives have undergone changes recently. As shown in the section above, affricates are realized as [tɕ], [tɕʰ], [tɕ*] word-initially. Previous studies reported that VOT (frication and aspiration duration) of fortis [tɕ*] was as short as 40ms. Lenis [tɕ] had 90ms and aspirated [tɕʰ] had the longest VOT as around 120ms (Sin et al., 2006; Kim, 2004). However, in recent work by Perkins and Lee (2010) and Jang (2012), perceptual and production cue of affricates have changed from VOT to F0, similar to SK stops. Lenis [tɕ] now has longer VOT duration as 108ms, thus overlapping with VOT of aspirated [tɕʰ] (113ms). Moreover, F0 has become an apparent cue in producing and perceiving affricates (Jang, 2011; Perkins & Lee, 2010). Thus, affricates in SK have F0

as a cue to distinguish the three-way affricate contrast. However, unlike studies in vowels and stops, there are relatively fewer studies regarding SK affricates (Jang, 2011).

Only one empirical study investigating North Korean affricates was found. Affricate analyses were included in Kang and Yun (2018)'s study on Hamkyong North Korean dialect speakers' production. These dialect speakers were North Korean defectors living in South Korea. Instead of VOT duration, the center of gravity of their affricates was analyzed. Results showed that Hamkyong speakers articulated affricates in a more anterior position than SK speakers. Kang and Yun (2018) examined whether age or length of residence in South Korea influenced their production. However, effect of age of acquisition (AoA) or length of residence (LoR) in South Korea did not affect production. Thus, regardless of AoA and LoR, NK speakers in Kang and Yun (2018) have not acquired SK manner of pronouncing affricates.

In summary, due to physical separation of territory, different language policy and ideologies, linguistic divergence has been observed between the two nations in various linguistic domains including phonetics. First, in SK, the merger of [e]-[æ] and [o]-[u] approximation was found (Sin et al., 2006; Han & Kang, 2013). In NK, the merger of [ɯ]-[u] and [ʌ]-[o] was reported (Lee, 1991; Kang, 1997). In terms of consonants, SK stops, and affricates have gone through changes in primary acoustic cue from VOT to F0. Unlike SK speakers, the NK refugees from Hamkyong still differentiated VOT of lenis and aspirated stops. In addition, the NK refugees produced affricates in more anterior position than SK speakers. However, it is unclear whether NK affricates also have changed its cue from VOT to F0 because F0 of NK affricates has not been examined (Kang & Yun, 2018).

1.3. Immigration of North Koreans to South Korea

According to Ministry of Unification (2015), the number of NK refugees has increased from 1990. Around 1960s, it was reported that the economic level of North Korea was higher than that of SK (Kim, 2013). However, after 1970s, South Korea made drastic economic progress and the economic situation was reversed (Kim, 2013). South Korea has economically developed but North Korea has decayed (Kim, 2013). Under Kim Il Sung, NK people have suffered through famine and severe poverty after the collapse of the Soviet Union (Kim, 2013). The economic gap between the two countries is now remarkable. The economic scale of the South is thirty-seven times bigger than that of the North (Lee, 2011). From around 1990, NK refugees have started to escape from hunger and head to SK to find new life (Kim & Jang, 2007).

From 2002 and 2019, almost one to two thousands of NK refugees came to South Korea every year and now the number of NK refugees is 30,000 (Ministry of Unification, 2015). NK refugee females take up more than 70 percent in total. To escape from North Korea, first, NK refugees move to Hamkyong region that is close to the border of China and cross the Du-man River at night, at the risk of their lives (Lee, 2002; Ministry of Unification, 2015). However, the Chinese government has an agreement with the North Korean government not to accept NK refugees but instead to repatriate them to the North. Thus, they have to first keep a low profile and escape China to gain refugee status as well as legal citizenship in South Korea. NK refugees often make a trek to cross over the borders of China, Vietnam, Thailand, and Laos to enter South Korea. Typically, they only move late at night to avoid tight security (Ministry of Unification, 2009). If they are

caught by police during the long journey, they repatriate to the North and they and their family are sentenced to death (Lee, 2011).

Once they arrive in South Korea safely, they are placed in an adaptation program and a background check for twelve weeks, 420 hours in total, in Hana institute (Ministry of Unification, 2015). To adapt better in South Korea, they attend classes to learn South Korean culture, SK language, and career paths in South Korea (Ministry of Unification, 2015). More specifically, for 50 hours, they are required to attend psychology consultation sessions as well as physical treatment because they usually have either a psychological trauma or are physically injured during the journey. For 135 hours, they learn basic economic system such as purchasing necessities and foods by themselves. For 177 hours, they are educated to find a career path in SK, by learning loan words, SK language, baking, computer, and driving. For the remaining 58 hours, they learn about government support policies for settlement (Choi, 2009).

Although North Korean defectors attended the adaptation program, they still face difficulties in adapting and experience identity conflicts in the south (Kim & Jang, 2007; Cho, 2010; Lee, 2011; Kim, 2013). According to Kim and Jang (2017), 44.8 percent of refugees reported that their incompetence with the language of SK affected their ability to find jobs. Specifically, they considered their poor proficiency of the SK as the main reason for their unemployment. In addition, 56.5 percent of refugees experienced workplace discrimination. They claimed that they experienced prejudice and stereotypes in the South Korean job market (Kim & Jang, 2007). In reports about studying in South Korea, Kim and Jang (2017) reported that the refugee children went through difficulties in adjusting in school life. The attendance rate is only 10 percent for high school and the

dropout rate of refugees is much higher than that of South Koreans. South Korean kids often show emotional discomfort regarding the refugee kids and North Korean accents (Kim & Jang, 2007). Thus, the North Korean refugee kids are usually targeted and isolated in school (Kim & Jang, 2007; Cho, 2010; Lee, 2011; Kim, 2013). Because they found difficulties in making South Korean friends, they usually chose refugee friends rather than establishing friendships with South Korean peers (Kim & Jang, 2007; Cho, 2010; Lee, 2011; Kim, 2013; Cho, 2014). Thus, due to differences in manner of pronunciation and negative perception towards North Korea and North Korean accents, North Korean refugees have faced difficulties in settlement. To adjust better in South Korea, they may need to eradicate North Korean manner of pronunciation and acquire SK manner of production as a second dialect. However, research that is related to North Korean refugees' second dialect acquisition (SDA) have not examined very far. Factors that affect their SDA have not been investigated yet.

1.4. Second dialect acquisition

North Korean refugee speakers living in Seoul, South Korea, are in a process of second dialect acquisition (SDA). Different from second language acquisition field, SDA focuses on a process of acquiring a second dialect of the same language. To better adapt in a new second dialect (D2) region, geographically mobile speakers often change their manner of speaking and try to assimilate their speech towards local people in a D2 community (Nycz, 2015; 2013; 2011; Siegel, 2010; Tagliamonte & Molfenter, 2007; Starks & Bayard, 2002; Chambers, 1992; Payne, 1980). SDA analyzes how speakers, who already have a first dialect (D1), acquire new dialectal features of the new D2

community (Siegel, 2010). For example, when a speaker, whose D1 is Canadian English, moves to Alabama, a new D2 region in the U.S., the speaker molds her or his D1 in order to acquire the new phonetic and phonological features of the D2 region (Munro, Derwing, & Flege, 1999).

1.4.1. Age of acquisition (AoA) and length of residence (LoR)

Previous literature has examined two main factors that affect successful SDA: (i) age of acquisition (AoA), and (ii) length of residence (LoR). First, D2 acquisition in production is directly affected by AoA (Kang & Yun, 2018; Nycz, 2013; Siegel, 2010; Tagliamonte & Molfenter, 2007; Starks & Bayard, 2002; Chambers, 1992; Payne, 1980). Previously, AoA was discussed as an important factor in acquiring the most local-like production as well as complex phonological rules in D2. For example, Tagliamonte and Molfenter (2007) reported only Canadian English speakers who moved to York, England at an earlier age (between two and four), were able to accurately produce complex phonological sounds such as that of the local-like /t/ in the York dialect. Specifically, the /t/ variants in York are complicated. In word-medial contexts, [t] is standard and commonly produced, but in word-final position, glottal stop [ʔ] appears. In their study, all the children acquired the glottal stop [ʔ] quickly. However, the children with later AoA (four years old) acquired /t/ realization slowly. Only the youngest child acquired both /t/ realization and glottal stop [ʔ] correctly. Their study supports findings that younger children achieve native-like levels in SDA. More related to this current study of NK speakers' SDA, Kang and Yun (2018) collected speech samples from 35 North Korean Hamkyong speakers who arrived in Seoul at different ages. The speech materials

collected were word lists including stops. The analysis of stop production showed that North Korean defectors who arrived in Seoul before age 40 produced lenis stops with longer VOT and aspirated stops with shorter VOT, thus more SK-like stop production than those with later AoA. Thus, AoA has been emphasized as a significant factor to attain local-like D2 variants; "the younger, the better" (Berthele, 2002; Chambers, 1992; Bortoni-Ricardo, 1985, Trudgill, 1981; Payne, 1976, 1980).

Unlike AoA, the effect of length of residence (LoR) has not consistently been found to be significant in SDA (Stanford, 2007; Kerswill, 1994; Ivars, 1994; Omdal, 1994; Wells, 1973). Kerswell (1994) studied Norwegian dialects and Stanford (2007) examined Sui dialect in China. In their studies, participants who had lived in the D2 region for more than thirty-five years used significantly less D2 variants than those with similar AoA but shorter LoR. In terms of D2 speech production, Foreman (2003) examined relations between LoR and using Australian English (D2) variants in North American English (D1) speakers' production. He reported that longer LoR was positively related to more frequent Australian production. However, the correlation was only significant when AoA factor was controlled. Kang and Yun (2018) also reported that, unlike how AoA affected both VOT of lenis and aspirated stops, LoR in a D2 region only partially affected their North Korean speakers' VOT of aspirated stops.

Instead of the role longer LoR plays, minimum LoR requirements for successful SDA was discussed. According to Siegel (2010), longer LoR is not always related to successful D2 acquisition. Rather, to attain D2 variants, it has been reported that at least five years of LoR in a D2 area is required (Chambers, 1992; Foreman, 2003). Previous literature found that, after five years, some speakers cannot acquire D2 features due to

fossilization (Chambers, 1992; Foreman, 2003). The idea of fossilization has been proposed to explain why D1 speakers cannot fully acquire D2 features even after they have lived in D2 region for a long time. Because speakers hit the limit of D2 acquisition, their D2 acquisition cannot be fully achieved (Chambers, 1992; Foreman, 2003). Thus, there might be some moderate effect of LoR but longer LoR may not be a necessarily significant factor to lead successful SDA.

1.4.2. Identity, interaction, and motivation

In addition to AoA and LoR, there are more additional factors that can facilitate successful SDA. Adult speakers can still acquire local-like D2 features and change their D1 production to assimilate in D2 region at a later age even after passing the critical period (Nycz, 2013; Siegel, 2010). In other words, AoA is not the only factor that predicts successful SDA. In addition, rather than just younger AoA and longer LoR, regular interaction with locals and attitudes towards D2 might be more influential to attain D2 variants (Siegel, 2010). Three factors have been highlighted in terms of adults' acquisition of D2: (i) identity in a D2 community, ii) regular interaction with locals and adaptation in a new community, iii) motivation for assimilation and attitude towards D1 and D2 (Nycz, 2015; Siegel, 2010).

Identity can be formed based on "the characteristics and attitudes of the social group or groups which that person belongs to or aspires to belong to (Siegel, 2010, p. 106)." It has been reported that strong identity as a member in a D2 region leads to more frequent usage of D2 variants in speech and thus, better D2 acquisition (Foreman, 2003). For example, speakers, whose D1 was north American English, identified themselves as

north American in Australia (D2 region), did not acquire Australian (D2) features. In contrast, speakers who identified themselves as Australian used more Australian D2 variants in speech (Foreman, 2003). However, in his study, strong identity in D2 region was significantly related to AoA. The author argued that mobile speakers who arrived in D2 region earlier were more likely to have a strong D2 identity and adopt D2 features. In other words, earlier AoA strongly influences D2 identity in the D2 region.

Whereas speakers' strong identification with D2 may lead to successful acquisition of D2 features, the opposite may also be true: the stronger speakers identify themselves as D1 community speakers, the less likely they are to acquire D2. Stanford (2007) found that Sui women had strong identity towards their father's clan throughout their entire life. For example, a speaker with a strong D1 region identity did not acquire D2 but still maintained D1 dialect even after living with a partner for forty years in D2 region (Stanford, 2007, 2008a). Stanford reported that Sui women used D1 to perform 'clan identity' (Stanford, 2007: p. 40). To show their strong D1 identity in the new clan, they preserve D1 dialect and restrain from acquiring the new clan variants.

Similarly, orientation towards D1 and D2 place and place identity are emphasized in Carmichael (2017) which examined the relationship between place orientation and identity, and D2 attainment in speech. When speakers have strong orientation and identity towards D1 place, they produce more D1 variants, regardless of their current residential status (Carmichael, 2017). In contrast, speakers with the weakest orientation and identity towards their D1 produced less D1 features. Her study found that strong identity and orientation towards D1 influenced preserving more regional (D1) dialectal features, which may restrain new D2 dialect acquisition.

In addition, regular interaction with locals has been considered an important factor. Interaction with a D1 group in D2 community leads to maintenance of the D1 and restrains D2 acquisition (Kerswill, 1994). On the other hand, interaction with locals in D2 community promotes D2 attainment (Bortoni-Ricardo, 1985). More specifically, according to these authors, rather than interaction with locals on instrumental purpose, interaction with D2 groups for integrative purposes is more beneficial to acquire D2. Relatedly, degree of exposure to the mainstream D2 local culture such as music and TV shows can lead to more usage of D2 variants (Bortoni-Ricardo, 1985, p. 210). Thus, significance of interaction with D2 locals has been emphasized. The effect of regular interaction with D2 locals on D2 acquisition was confirmed even after AoA and LoR were controlled (Berthele, 2002). Not only for D2 acquisition, regular interaction with locals for integrative purposes might also lead better adaptation within the D2 community. The more speakers interact with locals for integrative purposes, the better they attain D2, which may lead to better adaptation within D2 community.

Motivation for assimilation has also been identified as influencing acquisition of second dialect. Motivation to assimilate to the D2 and D2 community is often related to various factors such as (language) attitudes, identity, and regular interaction with locals (Siegel, 2010). Positive attitudes towards D2 and D2 community positively influence motivation to acquire D2 and thus, better D2 attainment (Rys, 2007). In contrast, positive attitudes towards the D1 and D1 community within the D2 region may promote the formation of stronger D1 identities. This positive attitude and strong identity towards D1 encourage more usage of D1 and hinder D2 acquisition (Kerswill, 1994). Based on positive attitudes towards D1, individual speakers may judge D2 more negatively than

D1. This negative judgment affects their degree of motivation to assimilate and the extent of their forming identities as D2 group members. Therefore, depending on speakers' (language) attitudes, they may not be motivated to acquire D2.

More recently, Nycz (2019) examined how motivation for assimilation, regular interaction and attitudes are related to SDA. She reported that having a local partner in D2 region could predict the most local-like vowel production among speakers. She claimed that having a local partner in D2 area could provide enough D2 input from a regular interaction with a significant interlocutor. Through the interaction with a local partner, speakers may also form positive attitudes towards D2. That positive attitude towards the D2 may motivate them to make more efforts to assimilate to the D2 and D2 community. Eventually, this may influence them to have a strong identity in D2 community (Nycz, 2019). She claimed that degree of motivation for assimilation can be strong depending on how often individuals interact with locals. However, it might be unclear whether being in a relationship with a local partner motivates them to assimilate in D2 area or whether they were able to find a local partner because they already had positive attitudes towards the D2 and were already motivated to assimilate D2 community. Thus, depending on how speakers evaluate D1 and D2 and their language attitudes, speakers can have different degrees of motivation for assimilation. In the next section, importance of language attitude in SDA is highlighted, describing how language attitudes are formed and affect the acquisition of D2.

1.4.3. Language attitudes

Speakers' degree of motivation may be strongly related to language attitudes towards D1 and D2. More specifically, if speakers have positive attitudes towards their own D1, their identity as D1 members and orientations toward D1 would be strong. Thus, due to positive attitudes towards D1, motivation for assimilation to D2 may become weak and they may try to preserve their D1 and hesitate to attain D2.

Depending on one's language ideologies, positive or negative language attitude towards one's D1 and D2 can be formed. For example, standard language speakers often have positive attitudes towards their own standard language because language ideology supports the belief that the standard language is only correct one, or is the "best" form of a given language (Irvine & Gal, 2000). Language ideology is defined as "sets of beliefs about language articulated by users as a rationalization or justification of perceived language structure and use" (Silverstein, 1979, p. 193). It conceptualizes beliefs about languages, specifically how languages should be used in society. Thus, language ideology mirrors societally formed beliefs about what language is and how it should be used in broader social and cultural systems, including political systems. Since standard language is learned through formal education and/or media exposure, it is associated with high status, prestige, and high social class, which is also associated with both symbolic and economic value, forming linguistic capital (Bourdieu, 1977). Thus, standard language ideology reproduces structures in the society in such a way that the language of people who have power is privileged. As a result, people within a society may associate standard language with high status and nonstandard varieties with low status (Preston, 1999).

Based on language ideology in society, individual members of society may come to hold language attitudes towards linguistic variants. For example, people might show preferable attitudes toward standard language because standard language is regarded positively in society. In contrast, due to language ideology, a society may express disfavor towards nonstandard variants. If D2 marks "privilege status" and "standardness" in a society, geographically mobile speakers may have already formed more positive attitudes towards the D2. Thus, after moving to the D2 region, they could be more motivated to attain D2 features. On the other hand, if their D1 is more positively judged than D2 in a society, they may aspire to maintain their D1 and D1 identity in D2 region. As a result, they become more reluctant to acquire D2 features and produce less D2 variants in speech.

Language attitude can be crucial part of acquiring D2. However, according to Preston (1999), speakers do not always form language attitude based only on language ideology. Rather, linguistic variants can be differently judged depending on experiences in D1 and D2. For example, Preston (1999) reported that younger students from six regions of Wales could not identify other Wales dialects as well as their own dialects. Because the students did not have sufficient experience and awareness of the varieties, they cannot identify and judge other Wales dialects as well as their own dialect. Based on this, the authors claimed that attitudes could be formed based on social cognition, including experiences with linguistic variants, social group memberships, group identities, and group boundaries. According to Preston (1999), based on experiences, people become to have preferences towards linguistic variants and understand ideologies that dominate in listeners' own communities. Therefore, evaluation towards standard and

nonstandard variants is not always aligned with language ideology, because experiences in the D1 and D2 community also affects individuals' evaluation (Preston, 1999; Podesva et al., 2015; McKenzie, 2008). Related to this, when speakers have prior exposure towards the D2 and construct favored attitudes towards the D2 community, they acquire more D2 variants, regardless of social notions surrounding the D2 (Walker, 2014; Nycz, 2015). This would mean that if speakers form negative attitudes toward the D2 community or D2, that may hinder the acquisition of D2 variants even if D2 is a prestige variety. Thus, related to current study, even if the D2 (SK) is judged more positively than their D1 (NK) in a society, speakers with prior negative experience in South Korea (e.g., discrimination) might hold negative attitudes towards the SK. This may restrain them to assimilate to SK locals. And thus, they may be more willing to preserve the NK and reluctant to acquire SK.

1.4.4. Gender

In addition, gender identity may affect language attitude. It has been reported that nonstandard dialects are often judged as masculine, working class, and low education. In contrast, standard varieties are considered more sophisticated, intelligent, and feminine (King et al., 2021; Pharao et al. 2014; Trudgill, 1972; Lambert, 1967). According to Trudgill (1972), women are more sensitive to prestige values than men. Thus, women have more favorable attitudes towards standard varieties (Trudgill, 1972; Rys, 2007). In contrast, men tend to prefer working-class speech (Trudgill, 1972; Rys, 2007). More specifically, Rys (2007) reported that females whose D1 was standard Southern Belgian Dutch acquired less nonstandard D2 (Maldegem Belgian dialect) variants than males. In

other words, male participants whose D1 was standard acquired nonstandard D2 variants more successfully than female participants (Rys, 2007). However, he explained that the male speakers made more efforts to acquire D2 than female speakers. He raised a possibility that male speakers' successful nonstandard D2 acquisition might be more related to their efforts of interacting with D2 locals. Thus, rather than a gender effect, according to Rys (2007), because the male speakers were simply more willing to interact with D2 locals, they might be more successful to acquire D2 than females. However, it raises a question on why females were more passive in making efforts to acquire D2 in his study. The females in Rys (2007) may hold more negative attitudes towards D2, causing them to be more reluctant to interact with D2 locals than the males and ended up acquiring less D2 than males. This gives a possibility that female nonstandard D1 speakers may acquire standard D2 variants faster than male nonstandard speakers. Applied to the current study, male NK participants may preserve nonstandard D1 (NK), but female NK participants may acquire D2 (SK) better and use D2 variants more in production.

Instead of biological gender difference, gender identity has also been considered in previous research (Levon, 2014). Participants' stereotypes about a speaker's perceived gender, and their endorsement of gender roles, can also affect attitudes towards linguistic variants. In Levon (2014), the link between pitch and sibilance of /s/ and a speaker's masculinity has been explored. Listeners with more normative concepts in gender roles judged high pitched and increased sibilance of /s/ to be gayer and less masculine. Although his study did not investigate relation between masculine identity and the 'less masculine /s/' production, it is hypothesized that his listeners' masculine identity may

affect them to not produce the 'less masculine /s/'. Based on these studies, I hypothesize that male participants with a stronger masculine identity may not acquire standard D2 as much as those who without strong masculine identity. Therefore, depending on speakers' prior experiences towards the D2 and their gender identity, their evaluation towards the D2 can be either more negative or positive, which might not be accorded with societally structured language attitudes.

1.4.5. Speech style and other factors influencing SDA

In addition to the interspeaker factors discussed above, SDA has investigated intraspeaker variation as well, including how geographically mobile speakers swiftly alter their 'style' of production depending on speech contexts, interlocutor, and topics in conversation (Grieser, 2019; Nycz, 2018, Labov, 2006; Schilling-Estes, 2002; Rickford & McNair-Knox, 1994; Bell, 1984). In what follows, intraspeaker variation in different speech contexts, interlocutors, and regional topics that also encourage speakers to produce either more D1 variants or D2 variants will be reviewed.

Because nonstandard speakers are aware of the perceptions of nonstandard dialects and their negative evaluations in societally structured language ideology, their speech may change in different speech contexts, resulting in stylistic variation. Style refers to speech variation within individual speakers (Schilling-Estes, 2002). Stylistic variation in different speech contexts is explained in the attention-to-speech model (Chambers, 2009; Labov, 2006, 1972, 1966) that speakers' styles may vary in different speech contexts, such as casual talk, interview talk, read speech, reading word lists, and minimal pair due to the amount of attention speakers can give to their speech. Style

shifting may also interact with language ideology in an interesting way too. For example, Labov (1972) reported that people who were members of lower social classes and nonstandard speakers may produce more hypercorrected speech when reading word lists and minimal pairs than people of higher social class and standard language. Hypercorrection is related to a concept of 'linguistic insecurity' (Labov, 1990). Speakers of non-standard varieties tend to evaluate their own varieties negatively (Lambert et al., 1960; Lambert, 1967; Labov, 1990; Fridland et al., 2005). Thus, they change their pronunciation in reading word lists because they consider their non-standard varieties to be incorrect. In the attention-to-speech model, when speakers hypercorrect their pronunciation, the hypercorrection can be considered a sociolinguistic marker (Labov, 1971).

However, recall that the speakers in Labov (2006) were not geographically mobile speakers. Thus, it is unclear whether nonstandard D1 speakers also produce more standard D2 features in read speech. In addition, and more importantly, recent studies have shown that formal, careful, and standard form of speech are neither the only possible patterns nor always associated with attention-to-speech (Schilling-Estes, 2008; Stuart-Smith et al., 2013; Johnson & Nycz, 2015; Gafter, 2016). Specifically, the previous studies presented that D1 nonstandard speakers produced more D2 standard features in conversational speech than in read speech (Schilling-Estes, 2008; Stuart-Smith et al., 2013; Johnson & Nycz, 2015; Gafter, 2016). Thus, read speech condition may elicit more formal pronunciation in nonstandard D1 (Gafter, 2016).

More specifically, Gafter (2016) examined production of [ʕ] and [ħ] in Hebrew. Currently in Isareli-speaking communities, [ħ] is considered more standard and modern

way of pronunciation. In contrast, although [ʕ] is considered historically conservative and prescriptively correct, [ʕ] is socially stigmatized with Mizrahi descent in Israel community. In the findings of Gafter (2016), D1 nonstandard Mizrahi participants produced the nonstandard stigmatized form ([ʕ]) more frequently in read speech than in conversational speech. In contrast, the standard form ([ħ]), was more frequently used in conversational speech. Thus, read speech condition may elicit more formal pronunciation in D1 nonstandard Mizrahi. In read speech condition, the nonstandard speakers might perform D1 identity, by producing more appropriate and correct form in their D1.

Similar to [ʕ] in Gafter (2016), the distinguished VOT between lenis and aspirated stops was a correct form in the past. Thus, the NK speakers may also distinguish VOT between lenis and aspirated stops more in read speech than conversational speech because the setting of read speech might also elicit the correct form in NK. More related to the current study, for example, Kang and Guion (2008) investigated how SK speakers shifted their stop production in clear and casual speech conditions. In their study, when SK speakers were asked to speak clearly, both VOT and F0 distinction in their speech were more enhanced (Kang & Guion, 2008). This, the enhanced VOT and F0 distinction might also be observed in SKs' production in more formal and careful speech production.

The NK and SK speakers in the current study may also show style shifting in stop production. However, Kang and Guion (2008) did not examine to what extent the degree of VOT and F0 distinction was different in careful and casual speech condition. In addition, they did not compare stop production of NK and SK speakers in different speech conditions. Thus, it is unclear to what extent the NK and SK speakers shift their stop production depending on speech conditions.

It is also reported that speakers may change their speech depending on who they are speaking to, i.e., interlocutors (Bell, 1984; Giles, 1980). Audience design describes that speakers shift their speech production depending on their audience (e.g., familiar vs. unfamiliar interlocutor; Bell, 1984). Furthermore, accommodation theory explains that speakers show stylistic variation by assimilating their speech production to their interlocutor in order to win approval in conversation with the interlocutor (Giles, 1980). In a more recent empirical study, Rickford and McNair-Knox (1994) showed that their African American participants used more African American vernacular English (AAVE) in an interview with African American interviewers than an interview with white American interviewer. Applied to the current study, NK refugee speakers may show hypercorrection and more use of D2 (SK) variants when they can pay more attention to speech (e.g., in careful speech). They may also show more use of D2 variants when conversing with a SK interlocutor (e.g., in an interview with SK researcher) through accommodation to the interlocutor speech.

Furthermore, topics of conversation have been found to influence geographically mobile speakers' speech patterns (Walker, 2014; Nycz, 2018; Grieser, 2019). For example, African American vernacular English (AAVE) speakers produced less AAVE variants in topics related to school (education) and career. On the other hand, when they talked about topics related to romantic relationships, childhood, and experiences in adolescence, they produced more AAVE variants (Grieser, 2019). It appears that more formal topics restrained AAVE while more personal topics elicited AAVE. Similarly, Canadian immigrants living in New York who typically maintained native production of vowels shifted to New York vowel patterns when conversation was about New York

(Nycz 2018). When her participants expressed distance from their D2 area (New York), by speaking about New York with negative valence, they produced more D1 variants (Canadian English variants). In contrast, when they expressed positive valence toward New York, the frequency of New York variants increased. This result suggests that speaking about a location or region may provoke the speech pattern associated with that region, while it may also be influenced by speakers' positive or negative valence toward the region.

From the perspective of intraspeaker variation, speakers subconsciously control their speech depending on speech condition, interlocutor, and topics and stances. Previously, AoA, LoR, interaction with locals, identity, and language attitudes and motivation of assimilation were discussed as factors that affect individuals' D2 like production. I also focus on how factors like AoA, LoR, (language) attitudes affect NK speakers' acquisition of SK (D2).

1.5. The most relevant previous studies

Oh & Yang (2013) and Kang & Yun (2018) are the only existing studies that investigated speech patterns of NK refugees living in South Korea. Although some summaries have been provided in the relevant sections earlier, here, the two studies are summarized in their own light.

Oh and Yang (2013) examined differences in the acoustic features of Korean stops in SK and Yanbian Korean dialect. As introduced in section 2.2.1, it is known that Yanbian dialect has critical values due to its regional and historical characteristics (Kim, 2009; Park, 2005). The Yanbian dialect is mainly spoken by heritage Koreans (Cosencok,

heritage Korean minority in China) in the Yanbian province of China, which is extremely close to the North Korean border. The Yanbian dialect provides critical linguistic materials since Koreans moved to China in the 19th century, and it is reported that speakers kept conservative norms of the Korean language (Kim, 2009; Ahn, 2007; Park, 2005). In addition, as introduced in the earlier section, the Yanbian dialect is known as tonal (Kim, 2009; Ahn, 2007; Park, 2005). Previous dialectal studies in South Korea have shown that tonal dialect speakers do not use pitch cue in stop productions since they are more sensitive to tonal changes (Kenstowicz & Park, 2006). Thus, Oh and Yang (2013) predicted that Yanbian dialect speakers may use different acoustic cues to distinguish stops.

They gathered ten younger Yanbian dialect speakers in their 20s (five females and five males) and six older Yanbian dialect speakers in their 50s (three females and three males) at Yanbian University in Yanji, China. Moreover, they recruited ten younger SK speakers in their 20s (five females and five males) at Korea University in Seoul. All participants produced one-syllable words, including stops with a cardinal vowel [a] and a final consonant [l] in a carrier sentence *iketto* ___*ita* "this is also ____", three times in a randomized order. In total, they measured VOT, F0 and H1-H2 of 468 tokens (9 words x 3 repetitions x 26 subjects) and statistically analyzed the measurements, using one-way ANOVA.

They found that acoustic properties of stops in Yanbian dialect were different from those of SK. First, as expected, the SK speakers did not differentiate VOT of lenis from aspirated but did differentiate VOT of lenis from fortis stops, by producing significantly shorter VOT for fortis stops than lenis stops. Unlike the SK speakers, the

Yanbian speakers did differentiate VOT of lenis from aspirated stops, by producing shorter VOT for lenis and longer VOT for aspirated stops. Unlike the SKs' VOT pattern, VOTs of Yanbian speakers overlapped in lenis and fortis stops. There was an age group effect too. The younger Yanbian speakers produced aspirated stops with significantly shorter VOT, in the direction of SK pattern, than the older Yanbian speakers. However, their VOT of aspirated stops was still significantly longer than that of SK speakers. With regard to F0, as expected, the SK speakers significantly distinguished F0 of lenis from aspirated stops (lower F0 for lenis and higher F0 for aspirated stops). In contrast, only male Yanbian speakers differentiated F0, and the differentiation was between lenis and fortis stops, producing fortis stops with higher F0 than lenis stops. Difference between age groups was not found in F0 results. In general, F0 distinction between lenis and aspirated stops was not found in the Yanbian speakers' speech. Finally, voice quality in the vowels following stops was related to distinguishing stops in both SK and NK. However, the SK speakers used H1-H2 to differentiate only between lenis and aspirated stops, using the creakiest voice quality (thus, lowest H1-H2) with fortis stops. In contrast, the Yanbian speakers used H1-H2 to differentiate the three-way stop contrasts, by producing the creakiest voice quality following fortis stops (thus, the lowest H1-H2 values), breathier voice quality after lenis stops, and breathiest voice quality following aspirated stops (thus, highest H1-H2 values). If NK stops are similar to those in the Yanbian dialect, as the authors predicted, NK stops may show different patterns of VOT, F0 and H1-H2 compared to those of SK stops.

More recently, Kang and Yun (2018) investigated acoustic properties of stops and affricates produced by NK refugees from Hamkyong, the northernmost North Korean

province bordering China. Notably, their study focused on two critical factors of second dialect acquisition, age of acquisition (AoA) and length of residency (LoR). They recruited thirty-five Hamkyong speakers and divided the participants by younger AoA (before 40Y), older AoA (after 40Y) group, and shorter LoR (less than 3Y) and longer LoR (more than 3Y) group. To compare production of Hamkyong speakers with that of SK speakers, they also gathered twenty SK speakers (ten younger and ten older speakers). Their participants read aloud word lists including lenis and aspirated stops and lenis affricate. More specifically, they read each of thirty-nine word lists that originated from North Korea and South Korea twice, including lenis and aspirated stops in word initial position. They also read aloud each of seven word lists from that were originated from North Korea and South Korea twice, including lenis affricate. They measured VOT of lenis and aspirated stops as well as center of gravity in lenis affricate. In the results of mixed effect linear regression analysis of stop production, they found that, unlike speakers in Seoul, Hamkyong speakers in general distinguished lenis and aspirated stops by VOT duration. More importantly, the Hamkyong speaker with younger AoA (before 40Y) produced lenis stops with significantly longer VOT and aspirated stops with significantly shorter VOT (thus, more SK-like patterns). However, the Hamkyong speakers with longer LoR (more than 3Y) only produced aspirated stops with shorter VOT. Thus, LoR in Kang and Yun (2018) only partially affected their Hamkyong speakers' VOT of aspirated stops. In terms of lenis affricate, the Hamkyong speakers articulated lenis affricate in a more anterior position than SK speakers. They also examined whether age or length of residence in South Korea influenced their lenis affricate production. However, effect of age or length of residence in South Korea did

not affect their lenis affricate production. Therefore, neither AoA nor LoR may have affected them to acquire SK manner of producing lenis affricate. Kang and Yun (2018) provided important results investigating the effect of AoA and LoR in Hamkyong speakers' second dialect acquisition. However, since they did not examine fortis production of Hamkyong speakers, it is unknown whether stops from Hamkyong dialect speakers are similar or dissimilar to stops in Yanbian dialect. Moreover, because they did not include F0, it is not clear whether Hamkyong speakers were acquiring the use of F0 as seen in the SK pattern. Furthermore, the participants in their study were from Hamkyong. Eighty five percent of North Korean refugees are from Hamkyong in South Korea; however, because Pyongyang standard North Korean (NK) has little been studied, it is unclear how (standard) NK stops are different from (standard) SK stops.

1.6. The current study and overview of this dissertation

The current study investigates second dialect acquisition (SDA) of SK stops produced by NK speakers from Pyongyang. It focuses on the use of VOT and F0 in three-way stop distinction, and investigates social and contextual factors influencing SDA. As discussed in Section 1.2.1., in SK, lenis and aspirated stops were primarily differentiated by VOT in the past, but they are now distinguished by F0 particularly in younger speakers' casual speech (Silva, 2006). This pitch distinction has become a major cue to differentiate lenis and aspirated stops in both conversational production and perception (Bang et al., 2018; Kang 2014; Oh, 2011; Kang & Guion, 2008; Kenstowicz & Park, 2006). It is suspected that NK variety has not undergone this change. This presents a situation for NK speakers living in Seoul, South Korea where acoustic realization of stops

in the host country differ subtly from the acoustic realization of stops in their home country. In turn, it presents an interesting SDA situation, and this led me to focus on stops in this study.

As discussed earlier, various social and contextual factors affect SDA and several of them were investigated in the current study. Some discussion is in order as we address a number of factors, language attitude, interaction with locals, orientation/identity, and motivation for assimilation, that are potentially interrelated in a complex manner. Part of the reason that makes this investigation complicated is the fact that relationships among these factors are unclear (Siegel, 2010; Camichael, 2017; Nycz, 2019). In addition, factors like regular interaction with locals, orientation, adaptation in D2 community, and motivation for assimilation might independently affect SDA and in turn influence having either positive or negative language attitudes towards D1 and D2. Based on prior studies, this dissertation measured the four social factors potentially affecting SDA as i) identification, ii) orientation toward NK and SK, iii) degree of assimilation, iv) language attitude using a language attitude survey and sociolinguistic interview. The measurements were then summarized as "Adaptation" score. Age of acquisition, length of residence, and 'Adaptation' were investigated together. However, each category in Adaptation score will be investigated independently after the relationship (collinearity) between each factor is examined.

This dissertation is structured as follows. In Chapter II, I compare the stop production of North and South Korean speakers in three different speech contexts: i) reading nonce words, ii) reading phrases, iii) conversation. In Chapter III, I examine to what extent sociolinguistic factors such as age of arrival, length of residence, and degree

of ‘Adaptation’ (identification, orientation, assimilation, and language attitude) affect the NKs’ production of SK-like stops. Chapter IV investigates how conversation topics (North Korea vs. South Korea) and stance towards the topics influences the NKs’ stop production. In Chapter V, interlocutor effects (North Korean interviewer vs. South Korean interviewer) on the NKs’ stop production were primarily examined. Chapter VI presents concluding remarks and suggests directions for future research.

Chapter II. Comparison between SK and NK Stop Production and the Effect of Speech Style

2.1. Introduction

As detailed in Chapter II, stops in South Korea (SK) underwent a change. In particular, younger SK speakers no longer use VOT to distinguish between lenis and aspirated but now F0 is applied in conversational speech, while VOT still separates the three-way distinction in careful speech (Sin et al., 2010). Like VOT, H1-H2 also appears to be no longer used as a cue to distinguish stops (in particular separating lenis from aspirated) by younger SK speakers. Thus, it appears that when SK speakers rely on F0 to distinguish lenis and aspirated in a vernacular mode, when they pay less attention to their speech (i.e., conversational speech), but revert to using VOT when they pay more attention to their speech (i.e., careful speech). However, to the best of my knowledge, the use of H1-H2 has only been examined in careful speech (Oh & Yang, 2013), and it is unclear whether H1-H2 is still important in conversational speech.

The available data from North Korean refugees show a different pattern for stop distinction. North Korean refugees from northern Hamkyong province were shown to still use VOT to distinguish between lenis and aspirated stops (Kang & Yun, 2018). In addition, Yanbian dialect speakers, residing in Yanbian Korean Autonomous Prefecture in China adjacent to North Korea, showed that while lenis and aspirated stops were distinguished based on VOT, their VOT of fortis and lenis overlapped. To distinguish lenis from fortis stops, the Yanbian speakers used H1-H2, by producing breathy voice quality for lenis stops and creaky voice quality for fortis stops (Oh & Yang, 2013). It

should be noted that stop patterns produced by standard Pyongyang North Korean (NK) speakers have not been investigated, and also the effect of stylistic variation on stops between careful and conversational speech has not been examined in NK refugees' production. The current chapter addresses these questions and also serves as baseline investigation upon which further investigations in later chapters are interpreted.

In this chapter, three research questions were addressed, investigating which acoustic cues differentiated the stop contrasts in NK and SK speakers in careful and conversational speech. Those questions will be further discussed below. In addition, **Table 2.1** displays predictions and hypotheses from previous works, with selected citations.

(1) What acoustic cues do SK speakers use to distinguish the stop contrasts in careful speech and conversational speech?

We examined SK production to confirm the patterns reported so far (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006), and the SK speakers serve as a comparison group in this study to examine NK production. It is hypothesized that SK speakers distinguish both VOT and F0 in careful speech (nonce words and phrases) but in conversational speech, only F0 would be used to differentiate between lenis and aspirated stops. H1-H2 of SK lenis and aspirated stops might also not be significantly different. However, considering that Oh and Yang (2013) is the latest study and did not include speech from conversational condition, the results might show different patterns in this study.

(2) What acoustic cues do NK defectors use to differentiate the stop contrasts in careful speech and conversational speech?

I predicted that NK refugee speakers are learning SK pattern of stops as their second dialect (D2), which entails short VOT for fortis and long VOT for lenis and aspirated stops, coupled with higher F0 on the vowel following fortis and aspirated, and lower F0 on the vowel following lenis. I further hypothesized that this pattern would appear in the careful speech (nonce words and phrases), if not both of the careful and conversational speech styles. This is based on the idea that NK refugee speakers are learning the standard SK, the variety spoken in the area where NK speakers reside, and that this desired D2 is more likely to be produced when speakers are able to pay attention to their speech in the careful speech style. In the conversational speech style, they may show SK pattern (if they have already acquired the D2) or their vernacular NK pattern (if they have not acquired the D2 and cannot carefully monitor their own speech).

Note that Kang and Yun (2018) reported that their North Korean refugees from Hamkyong significantly differentiated VOT between lenis, and aspirated stops in careful speech. This suggests that there is a possibility that our hypothesis will not be confirmed with regards to VOT (indicating that the speakers have not acquired the D2 pattern of stops). The role of F0 is still unknown in the acquisition of South Korean variety by North Korean speakers. It is unknown, however, whether the recruitment of pitch for stop distinction is specific to SK variety (e.g., Jang, 2011; Sin et al., 2006; Silva, 2006a; Silva, 2006b) or it has happened to both SK and NK. It may be that NK stops have not undergone changes in F0 and are similar with stops in Yanbian dialect (Oh & Yang, 2013). Nonetheless, the NK defectors have resided in South Korea for a varying length of time, and thus have been exposed to the covariation in F0 between lenis on one hand and fortis and aspirated stops on the other hand.

When it comes to H1-H2, it is not well known whether it is an important cue or not distinguishing NK stops. Even though Oh and Yang (2013) found the use of H1-H2 in Yanbian dialect stops, it is unknown to what extent the Yanbian dialect and North Korean dialects are similar to each other. This chapter explores the role of H1-H2 in both SK speakers' and NK refugees' stops.

(3) To what extent is NKs' stop production different from that of SKs in general?

Whereas the first two analyses above focus on the role of each cue (i.e., VOT, F0, H1-H2) in discriminating the three stop types within each language, the third question addresses how these cues differ across NK and SK. Results were statistically analyzed, using mixed effect linear regression model in this paper.

TABLE 2.1 Phonetic features included in analysis, with predictions and selected citations

Phonetic feature	*Prediction and citations*	
VOT	NK	SK
	In careful speech (Nonce words, Phrases) Fortis ≤ Lenis < Aspirated (Kang & Yun, 2018; Oh & Yang, 2013) **In conversational speech** No prior research If NK speakers retain older (NK) forms, we should find VOT distinction, but if the speakers have adopted the changes evident in current SK, we should find no VOT distinction between lenis and aspirated stops.	**In careful speech (Nonce words, Phrases)** Fortis < Lenis < Aspirated (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006) **In conversational speech** Fortis < Lenis = Aspirated (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006)

TABLE 2.1 Phonetic features included in analysis, with predictions and selected citations

Phonetic feature	*Prediction and citations*	
	NK	SK
F0	**In careful speech (Nonce words, Phrases)** Lenis = Aspirated < Fortis (Oh & Yang, 2013) **In conversational speech** No prior research If NK speakers retain older (NK) forms, we should not find F0 distinction, but if the speakers have adopted the changes evident in current SK, we should find F0 distinction between lenis and aspirated stops.	**In careful speech (Nonce words, Phrases)** Lenis < Fortis < Aspirated (numerically) (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006) **In conversational speech** Lenis < Fortis < Aspirated (numerically) (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006)
H1-H2	**In careful speech** Fortis < Lenis = Aspirated (Oh & Yang, 2013) **In conversational speech** No prior study If NK speakers retain older (NK) forms, we should find H1-H2 distinction in lenis (breathiest voice quality) and aspirated stops (breathier voice quality than fortis stops), but if the speakers have adopted the changes evident in current SK, it is hard to interpret results because voice quality in NK and SK stops in conversational speech has not been studied.	**In careful speech** Fortis < Lenis = Aspirated (Oh & Yang, 2013; Cho et al., 2002) **In conversational speech** No prior study

2.2. Methodology

2.2.1. Speakers

Each of twenty-two SK speakers and NK speakers (six-teen females and six males for each) provided speech samples and demographic information. The participants were paid a small amount of money for their time after the session was completed. The session included a reading task and a sociolinguistic interview. Since NK speakers are vulnerable in South Korea (Kim & Jang, 2007), I made sure that each participant was comfortable and understood that they can withdraw their participation at any time with no repercussions. I also explained that participants could skip any interview questions and freely express disagreement with me or with interview questions.

During the sociolinguistic interview, demographic questions were asked after building rapport, which are provided in Appendix A. Participants' responses to demographic questions are summarized in **Table 2.2.1.** All participants were in their early 20s. The NK speakers were from the Pyongan province in North Korea. The Pyongan province contains the capital city of North Korea (Pyongyang) and is a region where North Korean standard language is spoken. The NK speakers were from towns near the capital city, and they reported speaking North Korean standard language (NK) while living in North Korea. Age of arrival (AoA) and length of residence in Seoul (LoR) varied among the NK speakers (AoA: 9 to 31, LoR: 1 to 10). As for their education level, four NK speakers graduated from college in Seoul and have worked in Seoul, and eighteen NK speakers attended a high school for only North Korean students in Seoul. All NK speakers arrived in SK after 1992 when SK stops have started to change (Silva,

2006). The SK speakers were born in Seoul and have lived in Seoul for their entire life. They were recruited from Hankuk University of Foreign Studies in Seoul.

Table 2.2.1. Demographic information of participants

Country / **Information**	**NK**	**SK**
Mean Age	22.4 years old (SD: 4.1)	22.3 years old (SD: 3.1)
Hometown	Pyongan province	Seoul
Gender	16 females and 6 males	16 females and 6 males
Mean age of arrival (AoA)	18.9 years old (SD: 4.9)	N/A (Born in Seoul)
Mean length of residence (LoR)	3.7 years (SD: 3.4)	N/A (Born in Seoul)
Education background	Four college level and eighteen high school level	College level

2.2.2. Materials, speech style conditions, and recording procedure

In terms of materials and recording procedure, I used a list of nonce words and phrases containing target stops (careful speech condition), and sociolinguistic interviews (conversational speech condition), to collect speech samples in two distinct speech conditions. Thus, careful condition includes two different reading stimuli, nonce words,

and phrases. All participants completed the careful condition first before the conversational condition.

First, the nonce words had a CV syllable structure, with the three-way stops ([k]-[kʰ]-[k*], [t]-[tʰ]-[t*], [p]-[pʰ]-[p*] followed by cardinal vowels [ʌ] and [o] (e.g., /**kʌ**/, see **Table 2.2.2.1**). There was thus a total of 18 nonce words. Next, the phrases included all stops with a cardinal vowel [a], which were proposed from Kang and Guion, 2008, p. 9 (e.g., /**pʰa**n.pʰan.ha.ta/, see also **Table 2.2.2.2**). Like the nonce words, there was a total of 18 phrases. These phrases had four syllables. Typically, the initial syllable was repeated (e.g., /pʰan.pʰan/, except for the case of /p*an.c*ak/ and /pan.c*ak) and followed by /ha.ta/. (Note that the stops in the second syllable were not measured.) Unlike nonce words, these phrases had semantic content. Speakers were asked to produce the nonce words and phrases in a same carrier sentence "___ (*la)ko malha-yss-ta* (I said____ in)", which was also used by Kang and Guion (2008, 2009). Notice that the target stops appear in the utterance initial position of word and accentual phrase (AP-initial). This is because Korean phrasal intonation patterns affect F0 of stops (Kang & Guion, 2009; Kang & Guion, 2008).

Each speaker sat in front of a laptop computer, wearing a lavalier microphone Audio-Technica AT 899, which was connected to a Marantz PMD 670 flash drive recorder. Speakers completed the nonce word task first, followed by the phrase task. The computer screen presented each nonce word or phrase in a career sentence in a randomized order three times each. Speakers were asked to read aloud each item carefully. Thus, they produced each of 54 nonce words and phrases with the carrier sentence in total (9 stops x 2 vowels, [ʌ] and [o], x 3 repetition for nonce words and 9

stops x 2 phrases x 3 repetition for phrases). This task took approximately ten minutes to complete.

Table 2.2.2.1. Nonce words

Tokens	Carrier sentence	Translation
/kʌ/, /ko/	lako mal.ha-yss.ta (e.g. /kʌ/ lako mal.ha-yss.ta)	"I said /____ (Nonce word)/"
/k*ʌ/, /k*o/		
/kʰʌ/, /kʰo/		
/tʌ/, /to/		
/t*ʌ/, /t*o/		
/tʰʌ/, /tʰo/		
/pʌ/, /po/		
/p*ʌ/, /p*o/		
/pʰʌ/, /pʰo/		

Table 2.2.2.2. Phrases

Fortis stop series			
Phrases	Translation	Phrases with a carrier sentence	Translation
/**p*a**n.c*ak.ha.ta/	“to shine/to have ephemeral fame”	/p*an.c*ak.ha.ta/ko malha-yssta	“I said it is to shine/to have ephemeral fame”
/**p*a**ŋ. p*aŋ.ha.ta/	“to be packed/to have good condition (person)”	/p*aŋ. p*aŋ.ha.ta/ ko malha-yssta	“I said it is to be packed/to have good condition (person)”
/**t*a**n.t*an.ha.ta/	“to be strong/to be hard”	/t*an.t*an.ha.ta/ ko malha-yssta	“I said it is to be strong/to be hard”
/**t*a**ŋ.t*aŋ.ha.ta/	“to be short and chubby”	/t*aŋ.t*aŋ.ha.ta/ ko malha-yssta	“I said it is to be short and chubby”
/**k*a**n.k*an.ha.ta/	“to be fastidious/to be strict”	/k*an.k*an.ha.ta/ ko malha-yssta	“I said it is to be fastidious/to be strict”
/**k*a**m.k*am.ha.ta/	“to be pitch dark/to be ignorant”	/k*am.k*am.ha.ta/ ko malha-yssta	“I said it is to be pitch dark/to be ignorant”

Table 2.2.2.2. Phrases

Lenis stop series			
Phrase	Translation	Phrase with a carrier sentence	Translation
/**pa**n.pan.ha.ta/	“to be comley/pretty”	/pan.pan.ha.ta/ ko malha-yssta	“I said it is to be comely/pretty”
/**pa**l.pal.ha.ta/	“to break out”	/pal.pal.ha.ta/ ko malha-yssta	“I said it is to break out”
/**ta**n.tan.ha.ta/	“to be hard/to be strong”	/tan.tan.ha.ta/ ko malha-yssta	“I said it is to be hard/to be strong”
/**ta**ŋ.taŋ.ha.ta/	“to be dignified/to be imposing”	/taŋ.taŋ.ha.ta/ ko malha-yssta	“I said it is to be dignified/to be imposing”
/**ka**n.kan.ha.ta/	“to be nicely salted”	/kan.kan.ha.ta/ ko malha-yssta	“I said it is to be nicely salted”
/**ka**m.kam.ha.ta/	“to forget entirely/to have no news”	/kam.kam.ha.ta/ ko malha-yssta	“I said it is to forget entirely/to have no news”

Table 2.2.2.2. Phrases

Aspirated series			
/**pʰa**n.pʰan.ha.ta/	“to be even/to be flat”	/pʰan.pʰan.ha.ta/ ko malha-yssta	“I said it is to be even/to be flat”
/**pʰa**l.pʰal.ha.ta/	“to be lively”	/pʰal.pʰal.ha.ta/ ko malha-yssta	“I said it is to be lively”
/**tʰa**n.tʰan.ha.ta/	“to be solid/to be firm”	/tʰan.tʰan.ha.ta/ ko malha-yssta	“I said it is to be solid/to be firm”
/**tʰa**ŋ.kam.ha.ta/	“to write off a debt”	/tʰaŋ.kam.ha.ta/ ko malha-yssta	“I said it is to write off a debt”
/**kʰa**l.kʰal.ha.ta/	“to be spicy (food)/to have a scratchy throat”	/kʰal.kʰal.ha.ta/ ko malha-yssta	“I said it is to be spicy (food)/to have a scratchy throat”
/**kʰa**m.kʰam.ha.ta/	“to be dark/to be gloomy”	/kʰam.kʰam.ha.ta/ ko malha-yssta	“I said it is to be dark/to be gloomy”

Immediately following the reading task, the participant and I engaged in a sociolinguistic interview over approximately 45 minutes. Now the participant and I sat face to face, and the same recording device described above was used for this task as well. The interview questions were modified from sociolinguistic interview questions intended for immigrant population developed by Anastassiades et al. (2017). Two sets of interview questions were developed specifically for NK defectors and SK speakers (See Appendix B). The interview questions for NK speakers are categorized by three topics:

(i) Demographics, (ii) South Korea, and (iii) North Korea. More specifically, demographics had questions about their name, age, hometown, age of arrival (AoA), and length of residence (LoR) in SK. SK topics included life in SK, SK neighbors, culture shock in SK, relationship with SK people, SK culture, career and education in SK, trips in SK, and language attitudes towards SK language. NK topics consisted of life in NK, childhood in NK, NK education, NK neighbors and community, immigration process, relationship with NK group, and language attitudes towards NK language. In terms of the interview for SK speakers, they were asked to answer demographic questions, daily-life, neighborhood, career and education, experiences in childhood and adolescence, traveling experiences, friendship, and language attitudes towards other South Korean dialects and North Korean dialects. All participants answered all questions in the interview. After the interview, they filled out language attitude survey questions (Preston, 2002; Park, 2002).

NK speakers were recruited for two years from 2018 to 2020. The design of the study was modified in the early stage of the data collection. Accordingly, among twenty-two NK speakers, the first four NK speakers tested in 2018 did not produce stops in phrases. Nonetheless, they produced stops in nonce words and engaged with the SK interviewer in the conversational condition, thus providing data for both careful and conversational conditions. Also, the first NK four participants did not complete the language attitude survey. Aside from the four speakers, eight-teen NK speakers produced stops in both nonce words and phrases for careful condition and participated in the sociolinguistic interview. And, aside from the four NK participants, eight-teen NK participants completed the language attitude survey.

2.2.3. Tokens and measurement

Since the Korean language has phrasal intonation patterns, previous research emphasizes that the stops in accentual phrase (AP)-initial position, rather than middle or final position, should be analyzed (Kang & Guion, 2008; Silva 2006a, 2006b; Cho et al., 2002; Han and Weitzman, 1970; Kim, 1965; 1994; Lisker and Abramson, 1964; Silva, 1993). All stops in the nonce words, phrases, and conversational speech were in AP-initial positions. Number of stop tokens produced by SK and NK speakers in both careful (nonce words and phrases) and conversational conditions are shown in **Table 2.2.3.1** and **Table 2.2.3.2.** below.

Each stop was coded for the word containing the stop and the following vowel, as well as the careful and conversational speech condition. The duration of the VOT was measured from the left edge of the burst release to the onset of the following vowel, defined as the left zero crossing of the first complete periodic cycle (Idemaru & Guion, 2008). F0 and H1-H2 were measured at the mid-point of the vowel following the stop. The F0 was centered between participants to remove gender effects on F0 by calculating mean of F0 in each participant's production and using 'part' function in R environment (R Core Team, 2020). Since articulation rate is known to affect duration of VOT (Holliday, 2015; Kang, 2014; Li, 2013), articulation rate was measured as phrase duration divided by the number of syllables in the phrase. Phrase was identified based on definition of phrase in Korean (National Institute of the Korean Language, 2008), which is a chunk that consists of more than one word. A phrase constitutes clauses and/or sentence components. As similar with other languages, Korean has noun phrase (noun + particle), verb phrase (verb + sentence ending), adjective phrase (adjective + sentence

ending), adverb phrase (adverb + suffix), and adnominal phrase (adverb + adnominal + particle) (National Institute of the Korean Language, 2008; Na, 2007).

Table 2.2.3.1 Number of stop tokens produced by SK speakers

Stops	**Careful condition**		**Conversational condition**	**Total**
	Nonce word	**Phrase**		
[k]	131	132	1281	1544
[k*]	131	132	183	446
[k^h]	131	132	247	510
[t]	132	130	871	1132
[t*]	131	132	280	543
[t^h]	132	132	252	516
[p]	131	172	654	957
[p*]	131	129	70	330
[p^h]	131	132	292	555
Grand total	1180	1223	4130	6533

Table 2.2.3.2. Number of stop tokens produced by NK speakers

Stops	Careful condition		Conversational condition	Total
	Nonce word	Phrase		
[k]	134	96	2011	2241
[k*]	130	96	214	440
[k^h]	133	95	164	392
[t]	132	104	1403	1639
[t*]	131	91	508	730
[t^h]	131	97	264	492
[p]	128	132	922	1182
[p*]	129	62	84	275
[p^h]	128	96	330	554
Grand total	1176	869	5900	7945

2.2.4. Analysis

2.2.4.1. Separate analysis of NK and SK stop production

All analyses presented in this chapter were performed using mixed effect linear regression (Baayen et al., 2008) as implemented in the lme4 package (Bates, Mächler, Bolker, & Walker 2015) in the R environment (R Core Team, 2020). The first set of models (see 1-3 below) were run separately for NK and SK data to examine patterns of stop production. The models analyzing each acoustic cue (VOT, F0, and H1-H2) in each dialect (NK and SK, sum coded with NK as the reference level) included Manner of stops (Lenis, Fortis, Aspirated, categorical factor, sum coded, with Lenis as the reference) and

interaction with Speech Condition (nonce word, phrase, and conversational, sum coded with nonce word as the reference level) as fixed effects. Although careful speech condition includes production from both nonce words and phrases, stops in nonce words and phrases are separately analyzed in order to examine precise differences in stop production between nonce word and phrase conditions. The model examining VOT included articulation rate (continuous variable and centered) as a predictor to control for its influence on VOT. All three models included a random intercept for Word, as it was possible that dependent measures varied due to lexical context. A random intercept for Speaker was also added. All three models included a random slope for Stop by Speaker because by-speaker variation in the dependent variable could be conditioned by stop type. However, because F0 was centered to avoid gender effects, random slope for Stop by Speakers was excluded in F0 models. Stop and Speaker in the random effects were uncorrelated to aid convergence. When the interaction between Stop and Speech Condition was significant in a model, a separate model was run for speech condition in each dialect to examine how speakers use a cue differently depending on speech condition.

1) VOT ~ Stop*Speech Condition + Articulation rate + (1 + Stop || Speaker) + (1| Word)
2) F0 ~ Stop*Speech Condition + (0 + Stop || Speaker) + (1|Word)
3) H1-H2 ~ Stop*Speech Condition + (1 + Stop || Speaker) + (1|Word)

2.2.4.2. Comparison between NK and SK stops

Mixed effect linear regression models were also used to compare the acoustic variables (VOT and F0) across NK and SK stops (See 4-6 below). To compare speech patterns across dialects in general, Speech Condition was collapsed in these models. The dependent variable was VOT, F0, and H1-H2 (all continuous variables) in each model. All three models included Dialect (categorical factor, sum coded with NK as the reference) and Stop (categorical factor, sum coded with Lenis as the reference) and their interaction (Dialect*Stop) as the fixed effects. As in the first model, Articulation rate was included as a predictor in the model examining VOT. A random slope for Stops by Participants and random intercept of Word was included. I also uncorrelated random factors and removed a random intercept of Stops by Participants.

4) VOT~ Dialect + Stop + Dialect* Stop + Articulation rate + (1 + Stop|| Speaker) + (1|Word)
5) F0 ~ Dialect + Stop + Dialect* Stop + (0 + Stop|| Speaker) + (1|Word)
6) H1-H2 ~ Dialect + Stop + Dialect* Stop + (1 + Stop|| Speaker) + (1|Word)

In the results, the comparisons that are of most interest depend on the cue being examined. For VOT and F0, differences between lenis and aspirated are the focus, to examine whether NK speakers show recent changes in producing lenis and aspirated stops with similar VOT and different F0 (lower F0 for lenis and higher F0 for aspirated stops) like SK speakers.

2.3. Results

2.3.1. VOT

The mean VOT values of stops for SK careful speech (nonce words and phrases) and conversational speech are illustrated in **Figure 2.3.1.1.** The results of model (1) are reported in **Table 2.3.1.1**. Since a significant interaction between Stop and Speech Condition was found, SK speakers' VOT production was analyzed in each condition separately. VOT results in each condition are shown in **Table 2.3.1.2, 2.3.1.3**, and **2.3.1.4** respectively. In reading nonce word condition, SK speakers distinguished VOT between lenis and aspirated stops ($p < 0.01$), which supports the results of previous literature (Oh, 2011; Kang & Guion, 2009; Kang & Guion, 2008; Kim, 2004). Lenis stops had intermediate VOT, fortis stops had the shortest VOT, and aspirated stops had the longest VOT. However, in reading phrase and conversational speech condition, SK speakers did not differentiate VOT of lenis from aspirated stops ($p = 0.1$, $p = 0.5$, respectively), which supports findings in previous research (Oh et al., 2018; Kang & Guion, 2008).

Figure 2.3.1.1. VOT of Stops in SK speech

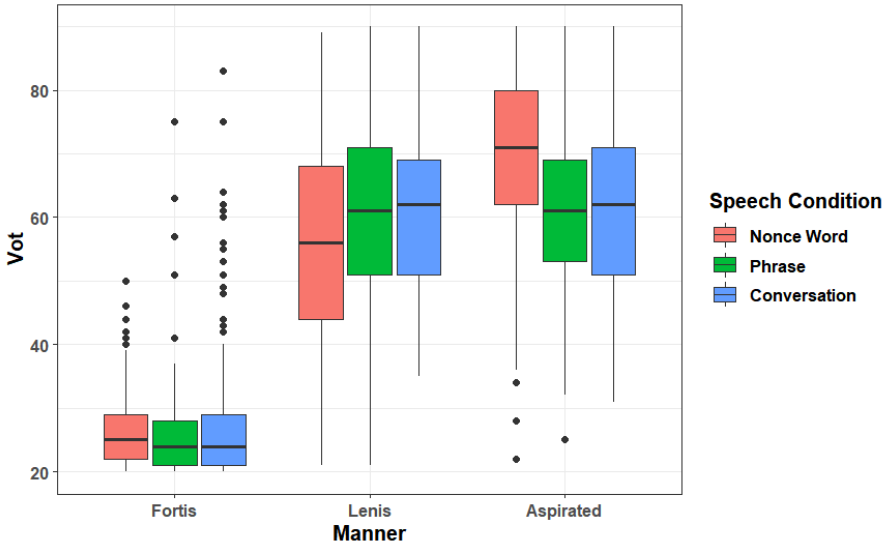


Table 2.3.1.1. The Output of Model (1) for SK speakers

VOT	Estimate	St. error	df	t-Value	p
(Intercept)	48.2143	1.1358	65.6023	42.450	< 2e-16 ***
Fortis	-29.3238	1.1432	114.6406	-25.651	< 2e-16 ***
Aspirated	20.3318	1.3305	62.1475	15.281	< 2e-16 ***
Phrase	-1.3645	0.9636	182.0187	-1.416	0.1585
Conversational speech	2.5791	0.6245	311.7405	4.130	4.67e-05 ***
Articulation rate	-5.0997	0.2393	6176.8198	-21.310	< 2e-16 ***
Fortis:Phrase	3.0625	1.2754	251.3132	2.401	0.0171 *
Aspirated:Phrase	-2.7730	1.3899	173.3166	-1.995	0.0476 *
Fortis:Conversational	0.7659	0.8263	424.2467	0.927	0.3545
Aspirated:Conversational	-5.5986	0.8955	246.9159	-6.252	1.77e-09 ***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.1.2. The Output of Model (1) for SK speakers' nonce word production

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	58.1683	3.0924	14.9800	18.810	7.84e-12***
Fortis	-39.5340	4.3771	15.0338	-9.032	1.84e-07***
Aspirated	24.7733	5.8728	32.6950	4.218	0.000183***
Articulation rate	-5.4029	0.4463	1156.3558	-12.107	< 2e-16***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.1.3. The Output of Model (1) for SK speakers' phrase production

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	60.0704	0.6092	1199.1955	98.603	< 2e-16***
Fortis	-42.8266	0.9479	1201.3705	-45.183	< 2e-16***
Aspirated	4.0905	2.5069	23.5459	1.632	0.116
Articulation rate	-4.0810	0.4111	1211.9160	-9.926	< 2e-16***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.1.4. The Output of Model (1) for SK speakers' production in conversational speech

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	63.5682	0.3550	671.4413	179.081	< 2e-16***
Fortis	-42.9415	1.7149	32.2231	-25.041	< 2e-16***
Aspirated	0.6709	1.0293	32.1541	0.652	0.519
Articulation rate	-4.8389	0.2613	3805.8526	-18.516	< 2e-16***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Next, mean values of VOT in NK's speech are presented in **Figure 2.3.1.2** The results from model (1) are presented in **Table 2.3.1.5**. NK's production was also separately analyzed in each condition (nonce words vs. phrases vs. conversational) because significant interaction between Stop and Speech Condition was found in the results. Post-hoc tests (Tukey's HSD) revealed that VOT of both lenis and fortis stops in reading nonce word condition was significantly different from that in conversational condition ($p < 0.01$, $p < 0.01$, respectively). More specifically, they produced lenis stops

with significantly longer VOT in conversational condition than in reading nonce word condition. In addition, they produced fortis stops with significantly shorter VOT in conversational speech than that of reading nonce word condition.

To examine VOT patterns in each speech condition, statistical results of VOT in each speech condition are reported in **Table 2.3.1.6**, **2.3.1.7**, and **2.3.1.8.** respectively. While SK speakers did not distinguish VOT between lenis and aspirated stops in both reading phrase and conversational speech condition, NK speakers significantly differentiated VOT between lenis and aspirated stops in all speech conditions; reading nonce words, phrases and conversational speech conditions ($p < 0.01$, $p < 0.01$, and $p < 0.01$ respectively). This shows that NK speakers have not acquired SK stop patterns in terms of VOT. NK speakers only marginally differentiated VOT between lenis and fortis stops ($p = .4$) when they read nonce words. Thus, NK speakers' stop production shows similar patterns to Yanbian speakers, showing similar VOT between lenis and fortis in reading nonce word condition. They produced clear lenis-aspirated contrasts using VOT. However, in **Figure 2.3.1.2.**, VOT of lenis was numerically shorter in conversational condition compared to that in nonce word and phrase condition. This does show a direction of SK pattern of VOT for lenis and aspirated stops, but this pattern was obtained in the conversational condition contrary to my prediction.

Figure 2.3.1.2. VOT of Stops in NK speech

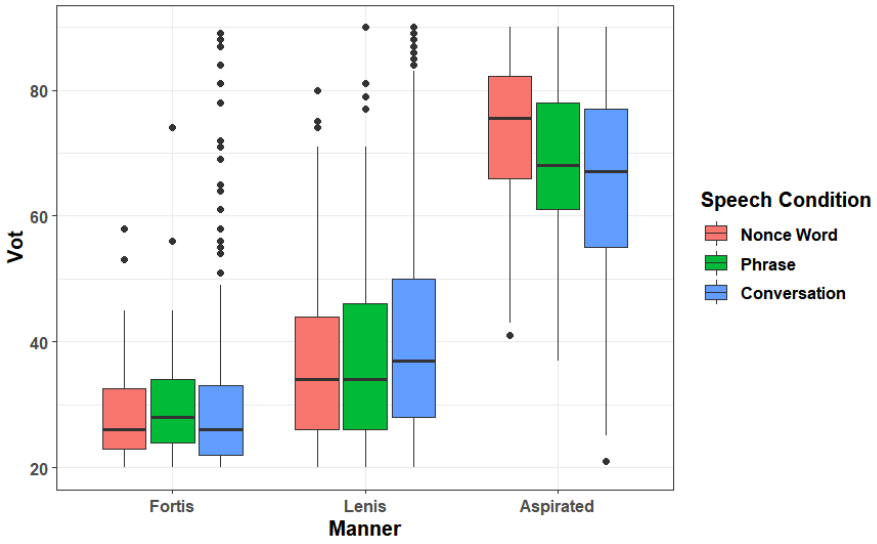


Table 2.3.1.5. The Output of Model (1) for NK speakers

VOT	Estimate	St. error	df	t-Value	p
(Intercept)	36.4477	2.0029	149.4557	18.197	< 2e-16 ***
Fortis	-8.7306	1.9506	636.0129	-4.476	9.02e-06 ***
Aspirated	36.4441	2.7768	195.2576	13.125	< 2e-16 ***
Phrase	3.9868	2.4022	678.4314	1.660	0.097442 .
Conversational speech	10.2919	1.4314	1506.4704	7.190	1.02e-12 ***
Articulation rate	-8.8227	0.2031	10797.1206	-43.440	< 2e-16 ***
Fortis:Phrase	2.6572	1.7544	2394.9608	1.515	0.129997
Aspirated:Phrase	-8.8149	2.3294	932.0469	-3.784	0.000164 ***
Fortis:Conversational	-0.1308	3.1548	767.1519	-0.041	0.966944
Aspirated:Conversational	-11.3106	3.4242	779.6947	-3.303	0.001000 ***

Significance. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1

Table 2.3.1.6. The Output of Model (1) for NK speakers' nonce word production

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	31.0492	4.7358	3.7748	6.556	0.00342**
Fortis	-6.0046	6.3346	3.5945	-0.948	0.40244
Aspirated	46.3535	6.3401	3.5912	7.311	0.00280**
Articulation rate	-2.4698	0.4567	1066.0845	-5.408	7.86e-08***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.1.7. The Output of Model (1) for NK speakers' phrase production

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	32.5016	2.5534	14.8886	12.729	2.1e-09***
Fortis	-13.1687	2.7023	18.6633	-4.873	0.000111***
Aspirated	40.5719	2.6674	17.7283	15.211	1.3e-11***
Articulation rate	-5.9751	0.5162	864.0431	-11.382	<2e-16***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.1.8. The Output of Model (1) for NK speakers' production in conversational speech

VOT	Estimate	St. error	Df	t-Value	p
(Intercept)	37.841	1.367	23.099	27.675	<2e-16***
Fortis	-15.663	1.809	49.199	-8.658	1.85e-11***
Aspirated	34.614	1.591	42.146	21.763	<2e-16***
Articulation rate	-9.426	0.272	5458.122	-34.660	<2e-16***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

The final analysis was to compare VOT between SK and NK. The mean VOT values across stops between NK and SK are presented in **Figure 2.3.1.3.** In this analysis, the data from the two speech conditions are pooled together. The result from analysis model (4) is reported in **Table 2.3.1.9.**

Figure 2.3.1.3. VOT of NK and SK

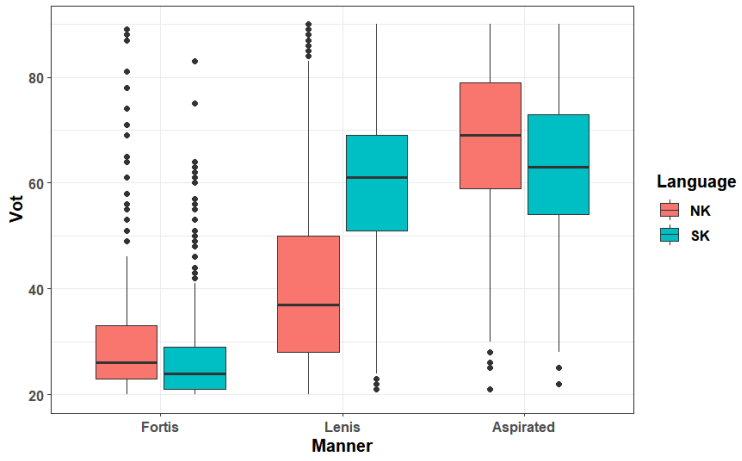


Table 2.3.1.9. The Output of Linear Mixed Effects Model to compare VOT between NK and SK speakers in general: Lenis is the reference category.

VOT	Estimate	St. error	df	t-Value	p
(Intercept)	44.8792	0.7101	64.6589	63.201	< 2e-16 ***
Dialect SK	7.2641	0.9337	48.4544	7.780	4.47e-10 ***
Fortis	-22.7781	0.8234	115.9089	-27.663	< 2e-16 ***
Aspirated	28.1775	1.3412	51.5052	21.009	< 2e-16 ***
Articulation rate	-6.8260	0.1688	13907.2328	-40.439	< 2e-16 ***
Dialect SK:Fortis	-5.5844	0.9991	63.5107	-5.589	5.13e-07 ***
Dialect SK:Aspirated	-13.0065	1.8199	43.7011	-7.147	7.23e-09 ***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

The main effects of Dialect and Stop were significant ($p < .001$ for all); however, what is critical to our research question is the significant Dialect x Stop interactions. Post-hoc t-tests with Tukey's HSD correction directly compare NK and SK stops instead of interpreting the interactions. The results indicated that all comparisons were significant. VOT of fortis and lenis stops were shorter for NK than for SK ($\beta = -1.6$, SE = 0.6, $z = -2.7$, $p = 0.006$ for fortis; $\beta = -25.8$, SE = 0.3, $z = -71$, $p < 0.0001$ for lenis), but VOT of aspirated stops was longer for NK than for SK ($\beta = 5.7$, SE = 2.7, $z = 2.1$, $p = 0.03$ for aspirated). Of particular interest was that NK VOT was shorter for lenis and longer for aspirated stops than SK VOT. VOT of lenis stops was significantly different between NK and SK speakers ($p < 0.01$). More specifically, VOT of lenis stops in NK speakers was significantly shorter than that of SK speakers. In addition, VOT of fortis stops in NK speakers was significantly shorter than that of SK speakers ($p < 0.01$).

VOT of aspirated stops were also significantly different across SK and NK speakers ($p = 0.03$). Specifically, NK speakers produced aspirated stops with longer VOT than SK speakers. Recall that the change in SK stops involved lengthening lenis VOT (Oh & Yang, 2013; Kang & Guion, 2008; Kang & Guion, 2008; Silva 2006a, 2006b). We confirm this in the current data for SK stops, but we do not see it for NK stops.

2.3.2. F0

First, the SK mean F0 values across stops from nonce words, phrases, and conversational speech are illustrated in **Figure 2.3.2.1**. The results of analysis model (2) are reported in **Table 2.3.2.1.** In general, SK speakers distinguished F0 between lenis and aspirated stops ($p < .01$ and $p < 0.1$, respectively), which supports the results of previous

literature (Oh et al, 2018; Bang et al., 2018; Kang 2014; Oh, 2011; Kang & Guion, 2008; Kenstowicz & Park, 2006; Silva, 2006). Although it is not critical to our research question, SK speakers also distinguished F0 between fortis and lenis ($p < 0.01$). SK speakers' F0 was statistically analyzed in each condition separately because an interaction between Stop and Speech Condition was significant. F0 results in each condition are shown in **Table 2.3.2.2, 2.3.2.3,** and **2.3.2.4** respectively. In all speech conditions, SK speakers distinguished F0 between lenis and aspirated stops ($p < 0.01$ for all), which supports the findings from previous literature (Oh et al, 2018; Bang et al., 2018; Kang 2014; Oh, 2011; Kang & Guion, 2008; Kenstowicz & Park, 2006; Silva, 2006).

Figure 2.3.2.1. F0 of Stops in SK speech

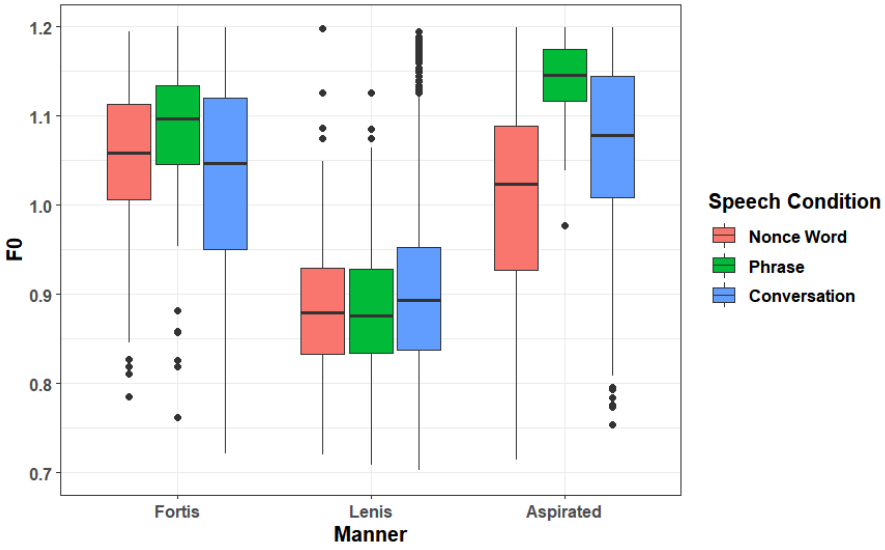


Table 2.3.2.1. The Output of Model (2) for SK speakers

F0	Estimate	St. error	df	t-Value	p
(Intercept)	1.043596	0.006431	81.726591	162.278	< 2e-16 ***
Fortis	0.043074	0.009275	66.749628	4.644	1.65e-05***
Aspirated	0.111661	0.010180	50.840847	10.969	5.24e-15 ***
Phrase	-0.002580	0.006544	71.070961	-0.394	0.694591
Conversational speech	0.033951	0.004496	118.166946	7.552	9.92e-12 ***
Fortis:Phrase	-0.003480	0.009061	84.179622	-3.841	0.000237 ***
Aspirated:Phrase	0.037127	0.009363	68.376504	3.965	0.000178 ***
Fortis:Conversational	-0.001781	0.006412	160.136453	-0.278	0.781578
Aspirated: Conversational	0.027298	0.006487	107.905127	4.208	5.35e-05 ***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.2.2. The Output of Model (2) in SK speakers' nonce words production: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.88126	0.02020	33.72885	43.631	< 2e-16 ***
Fortis	0.16440	0.02736	33.07704	6.009	9.30e-07 ***
Aspirated	0.12955	0.02756	31.70481	4.701	4.82e-05***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.2.3. The Output of Model (2) in SK speakers' Phrase production: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.87761	0.01520	21.61621	57.75	< 2e-16 ***
Fortis	0.16668	0.02060	21.09581	8.09	6.65e-08 ***
Aspirated	0.27796	0.01299	19.91456	21.40	3.26e-15 ***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.2.4. The Output of Model (2) in SK speakers' conversational speech: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.89927	0.01537	21.47830	58.523	< 2e-16 ***
Fortis	0.14052	0.01440	28.65354	9.758	1.30e-10 ***
Aspirated	0.21685	0.01403	23.86143	15.455	6.29e-14 ***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Figure 2.3.2.2 shows the NK mean F0 values across stops in careful speech (nonce words and phrases) and conversational speech respectively. The results of analysis model (2) are reported in **Table 2.3.2.5.** Significant interaction between Speech Condition and Stop was found. Post-hoc tests (Tukey's HSD) revealed that F0 of lenis and aspirated stops in reading nonce word condition was significantly different from that of reading phrase and conversational condition ($p < 0.01$, $p < 0.01$, respectively). Specifically, they produced aspirated stops with significantly higher F0 in reading phrase and conversational condition than in reading nonce word condition (for F0 of lenis-

aspirated contrast in reading nonce word: $\beta = -0.02$, SE = 0.03, z = -0.6, p = 0.79; for F0 of lenis- aspirate contrast in reading phrase: $\beta = -0.2$, SE = 0.04, z = -4.8, $p < 0.0001$; for F0 of lenis- aspirated contrast in conversational condition: $\beta = -0.2$, SE = 0.01, z = -18. 9, $p < 0.0001$)

To analyze NK's F0 more precisely, a model was run individually in each speech condition which are presented in **Table 2.3.2.6**, **2.3.2.7**, and **2.2.3.8**. F0 of NK stops showed that NK speakers did only marginally differentiate F0 between lenis and aspirated stops in reading nonce word condition (p=0.0581). In both reading phrases and conversational speech, unlike in reading nonce word condition, NK speakers differentiated F0 between lenis and aspirated stops ($p < 0.01$). They lowered F0 when producing lenis stops and raised F0 in fortis and aspirated stops. Although F0 of lenis and fortis were not focused on this study, NK speakers produced fortis with significantly higher F0 than lenis ($p < 0.01$).

In the reading phrase and conversational condition, NK F0 patterns showed a more SK-like way of producing stops, differentiating lenis and aspirated by F0. In the reading nonce word condition, unlike SK speakers, NK speakers did not significantly differentiate F0 between lenis and aspirated. In Labov (2006, 1972, 1966), nonstandard dialect speakers produced standard varieties in reading nonce word condition. However, unlike Labov's findings, NK speakers did not show SK-like F0 patterns when reading nonce words. Rather, they produced SK-like F0 distinction in reading phrases and conversational speech. Compared to reading nonce words, reading phrases and conversational condition led NK speakers produce more SK-like stop patterns, both in terms of F0 and VOT. These results cannot be explained by Labov's theory of attention

to speech. One possibility is that they might have assimilated to the speech patterns of the SK interviewer.

Figure 2.3.2.2. F0 of Stops in NK speech

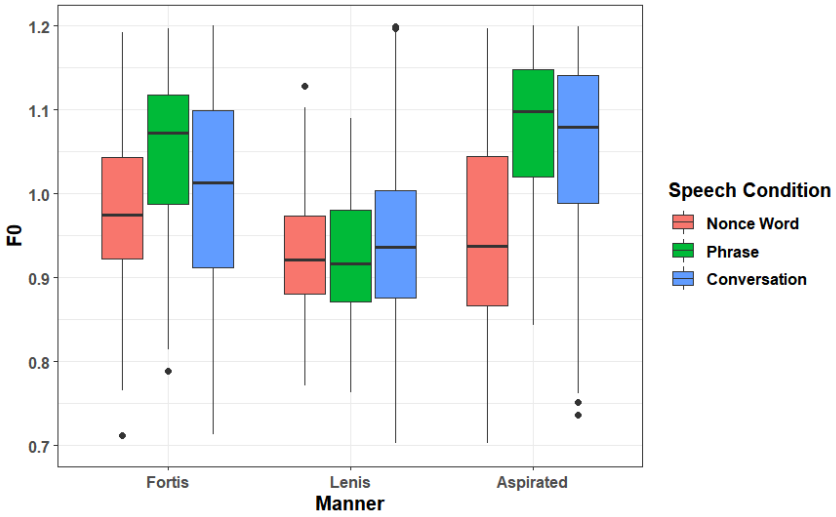


Table 2.3.2.5. The Output of Model (2) for NK speakers

F0	Estimate	St. error	df	t-Value	p
(Intercept)	1.01146	0.01570	366.04902	64.435	< 2e-16 ***
Fortis	0.06809	0.02132	202.36144	3.193	0.00163 **
Aspirated	-0.02237	0.02351	367.89276	-0.951	0.34211
Phrase	0.01453	0.02181	387.00201	0.666	0.50562
Conversational speech	0.08200	0.01354	729.93535	6.058	2.21e-09 ***
Fortis:Phrase	-0.02334	0.03014	458.24883	-0.774	0.43904
Aspirated:Phrase	0.10076	0.03140	402.11036	3.209	0.00144 **
Fortis:Conversational	-0.04135	0.01764	1244.21234	-2.344	0.01922 *
Aspirated: Conversational	0.15085	0.02165	474.24410	6.968	1.08e-11 ***

Significance. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1

Table 2.3.2.6. The Output of Model (2) in NK speakers' nonce words production: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.92476	0.02686	35.46346	34.430	<2e-16 ***
Fortis	0.07719	0.03544	33.50518	2.178	0.0365*
Aspirated	0.04023	0.02023	24.28266	1.989	0.0581.

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.2.7. The Output of Model (2) in NK speakers' Phrase production: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.90968	0.02838	21.75787	32.054	<2e-16 ***
Fortis	0.11843	0.02573	26.86349	4.603	8.95e-05***
Aspirated	0.18973	0.02003	18.13922	9.471	1.91e-08***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 2.3.2.8. The Output of Model (2) in NK speakers' conversational speech: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	0.93831	0.01144	8.53622	82.003	1.15e-13***
Fortis	0.07221	0.01558	40.99694	4.636	3.59e-05***
Aspirated	0.16574	0.01184	21.86535	13.996	2.16e-12***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

The final analysis compares F0 of SK and NK. **Figure 2.3.2.3** depicts centered F0 of NK and SK stops in general. The result of analysis model (5) is reported in **Table 2.3.2.9.**

Figure 2.3.2.3. F0 of NK and SK

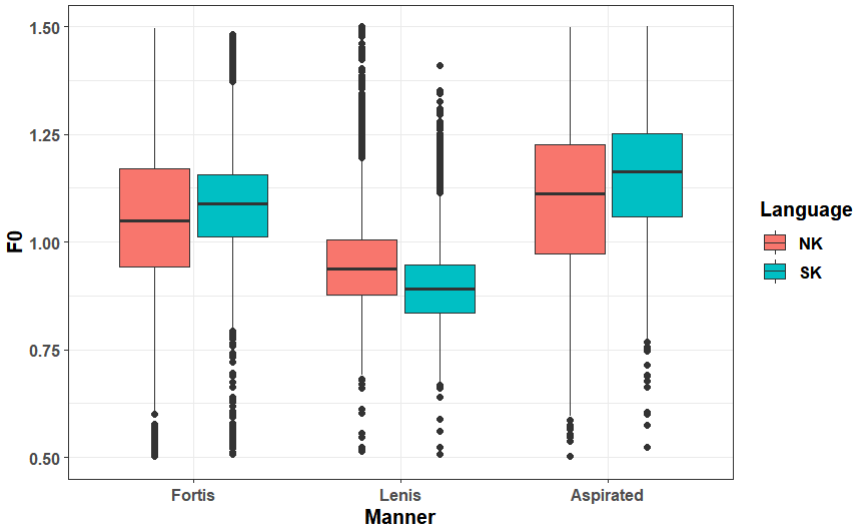


Table 2.3.2.9. The Output of Linear Mixed Effects Model to compare centered F0 between NK and SK speakers in general: Lenis is the reference category.

F0	Estimate	St. error	df	t-Value	p
(Intercept)	1.079e+00	4.769e-03	1.182e+02	226.255	< 2e-16 ***
Dialect SK	6.179e-03	5.788e-03	6.481e+01	1.068	0.28966
Fortis	3.036e-02	6.239e-03	3.284e+02	4.866	1.77e-06 ***
Aspirated	1.108e-01	8.398e-03	7.149e+01	13.193	< 2e-16 ***
Dialect SK:Fortis	1.914e-02	6.848e-03	1.268e+02	2.794	0.00601 **
Dialect SK:Aspirated	3.126e-02	1.077e-02	4.857e+01	2.903	0.00555 **

Significance. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1

The main effects of Dialect and Stop were significant ($p < .001$ for all); however, what is critical to our research question is the significant Dialect x Stop interaction. The post-hoc t-test with Tukey HSD indicated NK and SK F0 values were reliably different in each stop type. Although it is not critical to our research question, fortis F0 was lower for NK than for SK ($\beta = -0.02$, SE = 0.006, $z = -3.9$ $p = 0.0001$). Lenis F0 was higher for NK than for SK ($\beta = 0.04$, SE = 0.003, $z = 11.8$, $p < 0.0001$). Aspirated F0 was lower for NK than for SK ($\beta = -0.03$, SE = 0.01, $z = -2.3$, $p = 0.01$). The last two comparisons confirm that SK speakers use F0 to make more robust lenis-aspirated contrast than NK speakers do.

2.3.3. H1-H2

The SK mean H1-H2 values across stops from nonce words, phrases, and conversational speech are illustrated in **Figure 2.3.3.1**. The results of analysis model (3) are reported in **Table 2.3.3.1.** In general, SK speakers produced fortis stops with significantly lower H1-H2 than they produced lenis stops (thus, creakier voice quality, $p < 0.001$), confirming previous literature (Oh & Yang, 2013; Silva 2006a, 2006b; Cho et al., 2002). The results of analysis model (3) (**Table 2.3.3.1**.) indicated that there was a main effect of Stop (Fortis, $\beta = -2.8$, SE = 0.7, $t = -4.0$, $p = 0.0001$; Aspirated, $\beta = 0.2$, SE = 0.7, $t = 0.3$, $p = 0.69$) and Stop did not interact with Task, indicating that the pattern of H1-H2 across stop types was consistent across task types. Since the coefficients of the main effects reflect comparisons of a level (e.g., Fortis) to the grand mean, the current coefficients are not very helpful. Given this, we ran another model analyzing H1-H2 with only Stop as the fixed effect (treatment coding with the lenis as the reference) collapsing

the task levels (Fortis, β = -4.9, SE = 0.9, t = -5.6, p < 0.0001; Aspirated, β = -2.8, SE = 0.8, t = -3.2, p = 0.003)

Figure 2.3.3.1. H1-H2 of Stops in SK speech

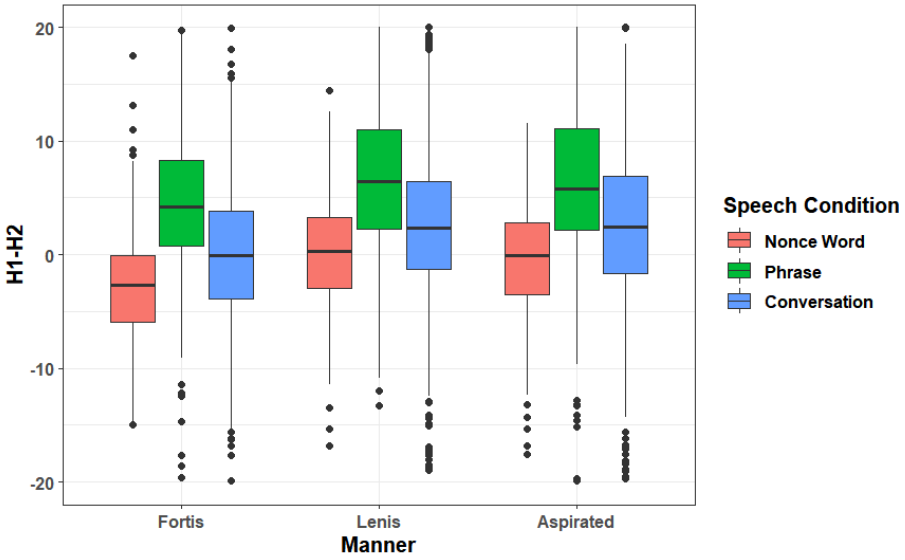


Table 2.3.3.1. The Output of Model (3) for SK speakers

H1-H2	Estimate	St. error	df	t-Value	p
(Intercept)	1.1584	0.7716	46.3794	1.501	0.140048
Fortis	-2.8467	0.7022	65.7639	-4.054	0.000136 ***
Aspirated	0.2897	0.7430	60.9444	0.390	0.697917
Phrase	3.7337	0.5003	163.2451	7.462	4.79e-12 ***
Conversational speech	-0.8531	0.3171	249.6619	-2.690	0.007623 **
Fortis:Phrase	-0.1349	0.6629	225.8036	-0.204	0.838919
Aspirated:Phrase	0.6026	0.7219	155.8503	0.835	0.405139
Fortis:Conversational	0.5234	0.4295	380.3138	1.218	0.223791
Aspirated: Conversational	-0.6700	0.4654	222.3363	-1.440	0.151383

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

The NK mean H1-H2 values in NK speakers' production are illustrated in **Figure 2.3.3.2.** The results of analysis model (3) for NK stops are shown in **Table 2.3.3.2.** The results of analysis model (3) for NK stops (Table 23) were consistent with those for SK stops. The main effect of Stop was significant (Fortis, $\beta = -2.5$, SE = 0.9, $t = -2.6$, $p = 0.008$) and the Stop effect did not interact with Task. The model analyzing H1-H2 with only Stop as the fixed effect (treatment coded with the lenis as the reference level) collapsing the task levels indicated that fortis and aspirated stops were produced with creakier voice quality than lenis stops (Fortis, $\beta = -7.4$, SE = 0.8, $t = -9.1$, $p < 0.0001$, Aspirated, $\beta = -3.9$, SE = 0.9, $t = -4.0$, $p = 0.00047$). Like the SK results, the lower H1-H2 associated with fortis stops (mean = -2.8) indicated that fortis stops had creakier voice

quality. The higher H1-H2 associated with lenis and aspirated stops (mean for lenis: 3.4, mean for aspirated: 1.4). These results are also similar to the H1-H2 pattern found for Yanbian dialect in Oh & Yang (2013).

Figure 2.3.3.2. H1-H2 of Stops in NK speech

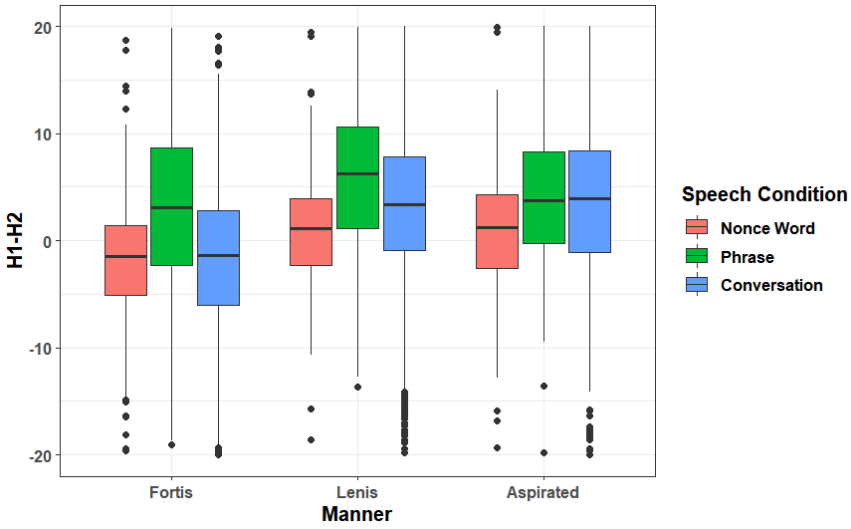


Table 2.3.3.2. The Output of Linear Mixed Effects Model of H1-H2 in NK speakers' speech: Lenis is the reference category.

H1-H2	Estimate	St. error	df	t-Value	p
(Intercept)	0.50608	0.37741	60.61296	1.341	0.185
Dialect SK	-0.47999	0.50189	47.42421	-0.956	0.344
Fortis	-3.70700	0.42923	100.90912	-8.636	8.98e-14 ***
Aspirated	0.03633	0.71884	49.87825	0.051	0.960
Dialect SK:Fortis	0.81126	0.53250	60.09157	1.523	0.133
Dialect SK:Aspirated	-0.09819	0.98229	43.49365	-0.100	0.921

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

The final analysis examines difference of H1-H2 in SK and NK. The last analysis compared H1-H2 between NK and SK speakers across three stop types while collapsing the data across task types (Figure 9). The results of the analysis model (**Table 2.3.3.3**.) indicated that there was a reliable main effect of Stop (Fortis, $\beta = -3.7$, SE = 0.4, $t = -8.6$, $p < 0.001$) and no Stop x Task interactions, indicating that H1-H2 did not vary depending on dialects.

Figure 2.3.3.3. H1-H2 of NK and SK

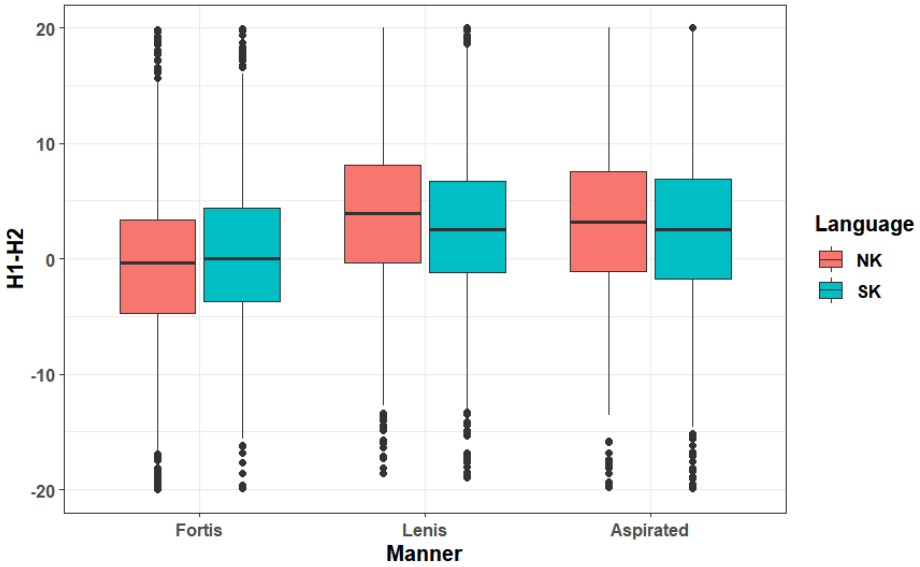


Table 2.3.3.3. The Output of Linear Mixed Effects Model to compare H1-H2 between NK and SK speakers in general: Lenis is the reference category.

H1-H2	Estimate	St. error	df	t-Value	p
(Intercept)	0.50608	0.37741	60.61296	1.341	0.185
Dialect SK	-0.47999	0.50189	47.42421	-0.956	0.344
Fortis	-3.70700	0.42923	100.90912	-8.636	8.98e-14 ***
Aspirated	0.03633	0.71884	49.87825	0.051	0.960
Dialect SK:Fortis	0.81126	0.53250	60.09157	1.523	0.133
Dialect SK:Aspirated	-0.09819	0.98229	43.49365	-0.100	0.921

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

2.4. Discussion

Previous literature reported that non-standard speakers tend to produce more nonstandard varieties in conversational speech when they do not pay much attention to their speech (Labov, 1972). Based on this, I hypothesized that NK speakers would produce NK stop patterns (their vernacular pattern) in conversational condition and switch to SK stop patterns when they can pay more attention to their speech in careful speech condition (nonce words and phrases). However, this hypothesis was not confirmed. Nonetheless, NK refugees' stops were different from SK speakers' stops in interesting ways. **Table 2.4** summarizes the results.

First, in terms of VOT and F0, the results in SK's production for the most part aligned with previous literature. They did not significantly differentiate VOT in lenis and

aspirated stops in general. However, the exception was found when they read nonce words, when they produced shorter VOT in lenis stops than aspirated stops. This seems to suggest that the task – reading nonce words (in the form of a single syllable) – led SK speakers to produce the most careful speech and this resulted in separation of lenis and aspirated on the basis of VOT. Here we should note that between reading nonce words and phrases, both considered the careful speech condition in this study, the former may allow speakers to monitor their speech more because the test word constituted only one syllable.

Unlike SK speakers, NK speakers, in general, did distinguish VOT across three stop types. However, just like SK data, we observed a slightly different pattern in the task of reading nonce words. In this task, NK speakers' mean VOTs were close between lenis (31ms) and fortis (16ms) stops and this difference was not statistically different. If we apply our interpretation of the SK data, this suggests that in the nonce word condition, in which speakers can monitor their speech most, NK speakers approximated lenis and fortis stops. This result is consistent with that of Oh and Yang (2013), which also found overlap between lenis and fortis categories in terms of VOT. Note that the two categories that approximate in SK production are lenis (63ms) and aspirated (69ms). These results indicate that NK speakers are not showing SK pattern of stop production regardless of attention they may be able to give to their own speech. In fact, when they can pay most attention to their speech, their VOT pattern is most distinct from the SK pattern.

As Jang (2017) reported, VOT of lenis and fortis stops were similar to each other in early 1900s in Seoul. SK stops underwent some sound changes since then as discussed in Chapter II, resulting in closer VOT values in lenis and aspirated. The fact that the NK

speakers in this study show a pattern similar to the pattern prior to the changes indicates that NK stops may not have undergone sound change and have kept the old stop patterns before the two countries separated. More specifically, lenis stops were produced with VOT that was closer to that of fortis, rather than aspirated stops. Recall that Kang and Yun (2018) did not include fortis in their analysis. Thus, in Kang and Yun (2018), it was unclear whether the Hamkyong speakers produced fortis and lenis stops with closer VOT. The current analysis has confirmed that NK speakers distinguish the three way stop contrasts using VOT as a cue in three speech conditions. This might simply mean that this pattern is their own original NK way of producing stops.

Second, in all speech conditions, SK speakers differentiated F0 in lenis and aspirated stops, with their lenis stops being produced with significantly lower F0 than aspirated stops. NK speakers showed somewhat different pattern from the SK speakers, and we obtained different pattern between nonce words on one hand and phrases and conversation on the other hand. Whereas NK speakers differentiated F0 in lenis and aspirated stops in reading phrase and conversation conditions, this F0 difference disappeared in the nonce word condition. Thus, in terms of both VOT and F0, NK speakers' stops were more SK-like in conversation speech and reading phrases, and they were non-SK-like in reading nonce word speech. The non-SK patterns that we observed in the NK production (particularly in the nonce word condition) may be reflective of the NK pattern of stop production used at home in NK, which is consistent with the SK stop production prior to the sound change that occurred around 1950. Thus, it is likely that NK did not undergo the same sound change involving stops that occurred in SK, where speakers produce lenis and aspirated stops with similar VOT but distinct F0.

In terms of H1-H2, different from previous studies, SK speakers in this study generally used creakier voice quality in fortis and aspirated stops, differentiating them from lenis stops. NK speakers showed consistent patterns with those of SK speakers. In other words, the pattern of H1-H2 differentiating the three categories was consistent across SK and NK. Given this result, I decided not to pursue this feature in the subsequent chapters.

The results so far show that NK speakers showed similar pattern to that of SK with F0 (with an interesting difference in one of the speech conditions) and H1-H2, while showing distinct pattern in terms of VOT. These results may indicate that the NK speakers are in the process of acquiring a SK way of pronouncing stops as a second dialect, but are in different acquisition stages across F0 and VOT. They might have noticed distinctive F0 changes and creaky voice quality in stops first, but might not recognize noticeable differences in VOT yet. It is reported that SK speakers consider that F0 is a more salient cue than VOT and hardly notice VOT difference between lenis and aspirated stops (Kong et al., 2018; Oh et al., 2018; Kang & Guion, 2008; Kim, 2004). F0 may also be a more salient variant in stop distinction than VOT for NK speakers.

However, this interpretation assumes that NK speakers are aiming to acquire SK pattern of stops. And if so, we would expect more SK-like pattern when they can afford to pay careful attention to their own speech per Labov's theory of attention to speech. However, we did not obtain such results. Instead, in a speech condition when speakers could pay most attention to their speech (i.e., reading nonce words), we repeatedly observed patterns that were most different from SK pattern; and we observed most SK-

like pattern in conversation style, where least attention to speech is expected. Thus, it appears that a different interpretation is needed to explain the pattern of results.

As noted in Chapter I, unlike the findings in Labov (2006), more recent studies showed that formal, careful, and standard form of speech are not the only possible patterns in attention-to-speech (Schilling-Estes, 2008; Stuart-Smith et al., 2013; Johnson & Nycz, 2015; Gafter, 2016). Instead, D1 nonstandard features were more observed in read speech than in conversational speech (Schilling-Estes, 2008; Stuart-Smith et al., 2013; Johnson & Nycz, 2015; Gafter, 2016). Recall that Gafter (2016) claimed that read speech might play a role in eliciting more formal and correct form in nonstandard D1. Based on this, D1 nonstandard NK speakers may also produce more nonstandard features in read speech than conversational speech because they might believe that the correct and careful form in D1 is expected in the read speech setting.

In conversational speech, NK speakers were having a conversation with a SK interviewer. According to Siegel (2010, and see also Chapter II), the more D1 speakers interact with D2 locals, the better they produce D2 variants. The current results may support the idea that communicating with a D2 speaker (SK) can be helpful to acquire more D2-like production. It is unclear whether more SK-like stop production is solely because of the SK interviewer; however, this chapter can give an idea that, non-standard D1 (NK) speakers produce more D2-like variants when they interact with D2 (SK) speakers, than reading word lists by themselves. In order to test this hypothesis, I investigated the speech sample collected from NK speakers having conversation with another NK speaker (see Chapter V).

Previous literature has shown that producing nonstandard features is related to positive attitudes and identity towards their nonstandard dialect (Ladegaard, 2000). Again, NK speakers in this study showed patterns of stop production distinct from those of SK stops, particularly in one of the careful speech conditions (i.e., reading nonce words). This may be a reflection of the speakers' positive attitudes toward their NK identity. The effects of language attitude are further addressed in Chapter IV.

Table 2.4- Overall statistical results by phonetic feature, given in relation to predictions from Table 1. See each result section for individual results.

Phonetic feature	*Prediction and citations*		*Results*	
VOT	NK	SK	NK	SK
	In careful speech (nonce word, phrase) Fortis ≤ Lenis < Aspirated (Kang & Yun, 2018; Jang, 2017; Oh & Yang, 2013) **In conversational speech** **In conversational speech** No prior study If NK speakers retain older (NK) forms, we should find VOT distinction, but if the speakers have adopted the changes evident in current SK, we should find no VOT distinction between lenis and aspirated stops. (It has not been studied)	**In careful speech (nonce word, phrase)** Fortis < Lenis < Aspirated (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006) **In conversational speech** Fortis < Lenis = Aspirated (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006)	**In reading Nonce word** Fortis ≤ Lenis < Aspirated ($p = 0.04$, $p < .01$, respectively) **In reading Phrase** Fortis < Lenis < Aspirated ($p < .01$, $p < .01$, respectively) **In conversational speech** Fortis < Lenis < Aspirated ($p < .01$, $p < .01$, respectively)	**In reading Nonce word** Fortis < Lenis < Aspirated ($p < .01$, $p < .01$, respectively) **In reading Phrase** Fortis < Lenis = Aspirated ($p < .01$, $p < .01$, respectively) **In conversational speech** Fortis < Lenis = Aspirated ($p < .01$, $p < .01$, respectively)

Table 2.4- Overall statistical results by phonetic feature, given in relation to predictions from Table 1. See each result section for individual results.

Phonetic feature	*Prediction and citations*		*Results*	
F0	NK	SK	NK	SK
	In careful speech (nonce word, phrase) Lenis = Aspirated < Fortis (Oh & Yang, 2013) **In conversational speech** No prior study If NK speakers retain older (NK) forms, we should not find F0 distinction, but if the speakers have adopted the changes evident in current SK, we should find F0 distinction between lenis and aspirated stops. (It has not been studied)	**In careful speech (nonce word, phrase)** Lenis < Fortis Lenis < Aspirated (numerically, Lenis < Fortis < Aspirated) (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006) **In conversational speech** Lenis < Fortis Lenis < Aspirated (numerically, Lenis < Fortis < Aspirated) (Oh et al., 2018; Kang & Guion, 2008; Sin et al., 2006)	**In reading Nonce word** Lenis = Aspirated < Fortis ($p = 0.05$, $p < .01$) **In reading Phrase** Lenis < Fortis Lenis < Aspirated (numerically, Lenis < Fortis < Aspirated) ($p < .01$, $p < .01$, respectively) **In conversational speech** Lenis < Fortis Lenis < Aspirated (numerically, Lenis < Fortis < Aspirated) ($p < .01$, $p < .01$, respectively)	**In reading Nonce word** Lenis < Fortis Lenis < Aspirated ($p < .01$, $p < .01$, respectively) **In reading phrase** Lenis < Fortis Lenis < Aspirated ($p < .01$, $p < .01$, respectively) **In conversational speech** Lenis < Fortis Lenis < Aspirated (numerically, Lenis < Fortis < Aspirated) ($p < .01$, $p < .01$, respectively)

Table 2.4- Overall statistical results by phonetic feature, given in relation to predictions from Table 1. See each result section for individual results.

Phonetic feature	*Prediction and citations*		*Results*	
H1-H2	NK	SK	NK	SK
	In careful speech Fortis < Lenis = Aspirated (Oh & Yang, 2013) **In conversational speech** No prior study If NK speakers retain older (NK) forms, we should find H1-H2 distinction in lenis (breathiest voice quality) and aspirated stops (breathier voice quality than fortis stops), but if the speakers have adopted the changes evident in current SK, it is hard to interpret results because voice quality in NK and SK stops in conversational speech has not been studied.	**In careful speech** Fortis < Lenis = Aspirated (Oh & Yang, 2013; Cho et al., 2002) **In conversational speech** No prior study	**In all speech tasks** Fortis < Lenis = Aspirated	**In all speech tasks** Fortis < Lenis = Aspirated

This chapter examined the stop production of NK and SK speakers. NK speakers showed different patterns of using VOT and F0 depending on speech condition. This work represents the first attempt to analyze VOT, F0, and H1-H2 in stop production by NK refugees from the Pyongan province, which includes Pyongyang city, the standard North Korean is spoken. The findings in this chapter revealed the pattern of production by NK speakers distinct from SK stops, which are not explained by the theory of attention to speech. I predict that sociolinguistic factors such as AoA, LoR, and language attitudes influence the NK speakers' stop production and these factors are examined in the next chapter.

Chapter III. Speaker effect (AoA and LoR), Adaptation, and Stop production

3.1. Introduction

This chapter investigates how Age of Arrival (AoA), Length of Residence (LoR), and Adaptation (Identification, Orientation, Assimilation, and Language attitude) affect North Korean refugees' production of stops. I examined VOT and F0 of lenis and aspirated stops, not including fortis stops because fortis stops did not go through changes in terms of VOT and F0 patterns in South Korean Seoul standard language (SK) and were consistently produced with the shortest VOT and creaky voice quality in following vowels. In Chapter II, I showed that whereas the SK speakers did not distinguish VOT of lenis from aspirated stops but used F0 more to distinguish the two stops, the NK speakers did use VOT to distinguish them. Thus, SK-like production should show less distinctive VOT but more distinctive F0 between lenis from aspirated stops. I aim to discover the most influential aspect that predicts SK-like production in this chapter. Three research questions are proposed. The three research questions will be further discussed below.

(1) To what extent do AoA, LoR, and Adaptation scores (identity, orientation, assimilation, and language attitude) affect VOT and F0 of NKs' stops?

First, it has been clearly presented that AoA and LoR affect acquisition of second dialect in previous literature (Siegel, 2010 and see also Chapter I). Many previous studies have attested that AoA plays a more important role than LoR in second dialect acquisition (Kang & Yun, 2018; Nycz, 2013; Siegel, 2010; Tagliamonte & Molfenter, 2007; Starks & Bayard, 2002; Chambers, 1992; Payne, 1980, see also Chapter I). Based

on this, I hypothesize that AoA influences NK speakers' production of SK-like VOT and F0 more than LoR. In addition, as minimum LoR of four to five years was required for acquisition of second dialect features in previous research (Chambers, 1992; Foreman, 2003), I also predict that, for NK speakers to sound like local SK speakers, at least four to five years of LoR in the SK community would be necessary.

It has been reported that both AoA and LoR are important factors in second dialect acquisition. However, in previous literature, some D1 speakers could still acquire and produce second dialect features even after the critical period and with the shorter LoR (Siegel, 2006, see also Chapter I). This indicates that AoA and LoR might not be the only significant factors in acquisition of second dialect. Along with AoA and LoR, Chapter I presented that sociolinguistic factors such as Identity, Orientation, Assimilation, and Language attitude towards D1 and D2 can be another important predictors in second dialect acquisition (Siegel, 2006). I use the term cultural Adaptation or Adaptation in this dissertation to refer to those factors collectively.

Walker (2014) examined how various social dimensions influence production and perception of rhoticity, /t/ realization and BATH variants. She coded her participants' responses in their sociolinguistic interviews based on five categories: (i) integration score (e.g., whether they have UK or U.S. citizenship, spouse, parents, children, and community in current country), (ii) experience score (e.g., whether they worked in UK or the U.S., have been to UK or the U.S., and have heavy UK or the U.S media exposure and a regular contact with UK or the U.S. community), (iii) football fandom score (e.g., whether they watched, like, and follow UK or the U.S. sports enthusiastically), (iv) attitude score (e.g., whether they like living in UK or the U.S. and cultures, people,

institutions in UK or the U.S.), (v) accent (e.g., yes/no). In terms of accent, she divided participants' answers into 'yes I want to blend my accent and try to code switch' and 'no I do not want to code switch and I do not like British/American accent' and coded 'yes/no' binary variable (Walker, 2014, p. 31-50). For example, if participants commented that they were willing to acquire UK accents, she marked them as 'yes'. In the results, she reported that participants with more experiences to UK produce more UK variants than those with less experience. Thus, among the categories, '(ii) Experience' might be an important factor to produce more D2 features in Walker (2014).

Similar to Walker (2014), Carmichael (2017) also used a scoring system but focused more on how orientation towards D1 region affected using r-lessness (D1 variant). She calculated place-orientation score in five areas: (i) identification (whether speakers identified with D1 or D2 culture), (ii) desire to leave (whether they wanted to leave D1 region), (iii) residential history (whether they left D1 before or lived outside of D1), (iv) schooling (whether they attend school in D1 or somewhere else), and (v) workplace (whether they work in D1 or somewhere else). In her findings, regardless of current residence of the participants, participants with strong orientation towards D1 region produced more D1 variants. As is described in more detail below, I adopted Walker (2014) and Carmichael (2017) to set up four categories of (i) identification, (ii) assimilation, (iii) orientation and (iv) language attitude to characterize the degree of cultural adaptation of North Korean refugees living in South Korea. The extent to which the NK speakers may be forming South Korean identity ('identification'), may have orientation toward South Korean society ('orientation'), and may have assimilated to the life in South Korea ('assimilation') is calculated based on the survey and interview

responses. Moreover, the survey and the interview also assessed to what extent they have positive or negative attitudes towards SK and NK language varieties ('language attitude').

Walker (2014) and Carmichael (2017) combined scores from their separate sociolinguistic categories to come up with a single composite score, and used the score in part of their analyses. However, this method makes it unclear which sociolinguistic aspect is the most influential that predicts acquisition of second dialect. In addition, my preliminary analysis using a composite adaptation score combining all four adaptation categories yielded no effects. For these reasons, the four categories of adaptation (Identification, Orientation, Assimilation, and Language attitude) are treated separately in this study.

Moreover, it is also not clear whether any of these categories of cultural adaptation outperformed AoA and LoR in predicting SK-like pattern of stop production. This is because significance of each factor in second dialect acquisition has little been examined so far to my knowledge. Note that AoA was a more significant factor than LoR and a strong relationship between AoA and identification was found in Foreman (2003). Specifically, in Foreman (2003), his Northern English (D1) speakers with younger AoA were more likely to have strong Australian (D2) identity, and showed better acquisition of Australian variants (D2) than the speakers with older AoA (see also Chapter I). Thus, it may be that the effect of AoA may overlap with those of some aspects of adaptation in SDA. Similar to his findings, the NK speakers with younger AoA may attain strong SK identity so that they might be adapted in SK society better and produce more SK-like stop patterns. To carefully examine the effects of AoA, LoR, Identification, Orientation,

Assimilation, and Language attitude, it is necessary to explore the relationship among these factors and check for issues of collinearity prior to examining the weight of individual factor that predict SK-like stop production. Given this, I pose the following research question:

(2) To what extent do the effects of Identification, Orientation, Assimilation and Language Attitude relate to each other?

From the first research question, the most influential factor in SK-like stop production can be discovered. However, some individual differences are expected (Siegel, 2010) such that some NK speakers still produced NK-like stops even with younger AoA and longer LoR and some NK speakers may produce SK-like stops even with older AoA and shorter LoR. I explore this possibility with the final research question (3). The chapter addresses Research question (2) first, before addressing (1) and then (3).

(3) What are the characteristics of NK speakers who show strong assimilation and dissimilation to the SK pattern of stop production?

3.2. Methodology

3.2.1. Speech materials and measurements

The same tokens of stops from speakers, speech materials, and recording procedure in Chapter II were used (see **Table 2.2.1.** in Chapter II). The data from both careful and conversation conditions were used here and they were collapsed for the analysis because I was interested in the effects of AoA, LoR, and Adaptation dimensions

that influence the speech of NK speakers generally, whether they are speaking carefully or conversationally. However, fortis stops were excluded in this chapter to focus on acoustic cues of lenis and aspirated stops, which showed the difference between NK and SK speakers in Chapter II (see **Table 2.2.3.2.** in Chapter II).

3.2.2. Coding Adaptation scores in sociolinguistic interview

As described in Chapter I., (language) attitude has complicated relationships with identification, orientation, experiences, and assimilation in D2 region (Siegel, 2010). To refer to various factors collectively, the term 'Adaptation' is used in this dissertation (see also Chapter I). Thus, in this chapter, Adaptation scores include subcategories of Identity, Orientation, Assimilation, and Language attitude and each subcategory will be treated independently after checking collinearity in this chapter. These categories and scoring methodologies are based on previous studies (Walker, 2014; Carmichael, 2017), but a few modifications are made. See **Table 3.1.** for the categories established and used for this study.

First, the category **Identification** refers to whether the speaker identifies more with D1 region or with D2 region. In Carmichael (2017), this factor predicted usage of the target variant. This category is used in a way consistent with Carmichael (2017) and Walker (2014). Second, the category of **Orientation** comes from Carmichael (2017); however, the meaning of the category as used in this study is slightly narrower. While Carmichael (2017) examined speakers' orientation toward D1 region as continued connection with D1 in four areas (desire to return, residential history, schooling, and workplace, see also section 3.1 and Chapter I), the NK participants in this study cannot

legally have connection with their D1 region. They cannot be relocated to North Korea even if they wish to and they are not allowed to have any contact with anyone in their D1 region. They have to be oriented in South Korea to survive no matter how much they are oriented toward NK (Park, 2011, see also Chapter I). In this way, the subcategories of orientation in Carmichael (2017) may not fit very well in this study. Thus, I changed the interview and survey items in the orientation category to those of emotional ones, for example, whether speakers prefer the lifestyles of South Korea (or North Korea).

Third, the category of **Assimilation** is a critical part that combines 'Experience' and 'Attitude' in Walker (2014). Previous literature reported that degree of assimilation affected better D2 acquisition, and thus, more frequent usage of D2 variants in speech (Nycz, 2019). This category is related to motivation and willingness to live like D2 locals do, regular interaction with D2 locals, and degree of adaptation in D2 community (Siegel, 2010). Considering that items of experience and attitude in Walker (2014) were related to motivation for assimilation in Siegel (2010), I combined items of 'Experience' and 'Attitude' in Walker (2014) and labeled it as Assimilation category.

The fourth category is **Language attitude**. Walker (2014)'s 'Accent' category calculated to what extent the speakers were willing to acquire D2 accent. Instead of using a binary variable like Walker (2014) did, a point score system was used like in the other categories. This category includes attitudes towards D1 and D2 varieties, and motivation and willingness for acquisition of D2, similar to the category of 'Accents' in Walker (2014).

These four categories of cultural adaptation were assessed as presented in **Table 3.1**. Instead of scores ranging from -6 to +2, as used in Carmichael (2017), each point was awarded every time the participant answers a question from each item in each category. For example, if a participant responded that she likes living in SK two times in the interview (an item in category c. Assimilation), she receives two points, gaining 1 point each time she mentions the sentiment (as indicated by "+1" in the table). Likewise, if a participant answers that she is proud of using NK dialect three times during the interview (an item in category d), she receives -3 for the item. Scores in each category are the sum of each item score. Thus, in general, a higher score indicates a more positive attitude towards SK, but a lower score shows a more positive attitude towards NK but a more negative attitude towards SK.

Table 3.1. Adaptation scores

Category	Measure
a. Identification	+1 Identity, legit member of SK 0 no data -1 Identity as NK, Proud of where they are from, being a member of NK (NK, NK hometown)
b. Orientation	+1 prefers/gets used to lifestyle/political system in SK +1 does not miss lifestyle/people/politics in NK 0 no data -1 prefers lifestyle/people/politics in NK -1 miss lifestyle/people/politics in NK

Table 3.1. Adaptation scores

Category	Measure
c. Assimilation	+1 likes living in SK +1 likes interacting with SK friends (integrated purpose) +1 likes people/culture of SK +1 watched/ watches SK TV shows/music +1 likes school/work in SK 0 no data -1 disparages living in SK/prefers living in NK -1 disparages interacting with SK friends (or just only interact because of work/institutional purpose) -1 only interact with NK friends -1 never watched/watches (or disparages watching) SK TV shows or listened/listens to SK music -1 likes/prefers people/culture of NK -1 likes/prefers school/work in NK
d. Language attitude	+1 Proud of acquiring standard Seoul Korean +1 willing to acquire standard Seoul Korean +1 Think Seoul Korean sounds better/friendly/intelligent/soft/correct 0 no data -1 Proud of using NK dialect -1 Proud of being marked as NK/willing to keep NK accent -1 Think NK dialect sounds better/friendly/correct/cool/soft

3.2.3. Adaptation categories and sample responses

In the sociolinguistic interview, the NK participants were asked to what extent they identified themselves as a legal and legit member of SK society (**Identification**). If they commented that they considered themselves as legit citizens in SK, they gain the point (Carmichael, 2017, p. 705). Some participants (Participants 1, 3, and 13) answered that they now considered themselves as SK member and were happy to be acknowledged as a member by SK community. Below are examples of comments that would result in a +1 for "identity, legit member of SK". All comments are translated from Korean:

> "I am just a normal SK person. I am the same as just normal SK people. I have freedom as much as other SK people and live like SK people, enjoying freedom and taking responsibility of my actions in SK society. (Participant 1)"

> "Well, I sometimes do not remember my childhood and old life in NK. I would say that I now am an ordinary SK person in SK society. I get used to this SK way of lifestyle, think like SK people, and act like SK people. I am happy to be treated as a common member in SK community (Participant 3)"

> "I am South Korean. I know I was born in North Korea, but it does not matter anymore. I am now protected by the South Korean government and a legal citizen of South Korea. And, I am proud of it (Participant 13)"

Different from the two participants above, Participants 2 and 5 give good examples of -1 for "identity, legit member of SK".

> "I am North Korean. Although I escaped there and have lived in SK for ten years, I cannot change my origin. I live here and get used to live here but I still cannot be a common South Korean. If I had to answer your question, I would answer I am 100% North Korean. (Participant 2)"

> "I never hide my NK identity. Every time people ask me where I am from or identification, I answer immediately that I am North Korean. I can never change my identity. (Participant 5)"

As described earlier, the '**Orientation**' category refers positive and sentimental feelings toward North Korea. As I interviewed the NK participants, they responded how much they miss or wish to visit their hometown in NK (if it were possible). Because the scoring system is set up so that identification and orientation toward North Korea is evaluated with negative values across all categories, an indication of sentimental feeling toward North Korea received -1 point and an indication of non-sentimental feeling toward North Korea received +1 point in this category.

Below are examples of the highest score for "Orientation" (thus, meaning that they do not miss NK).

> "I do not want to go back there now. I have got more important friends, significant partner, and new family. My parents are there but I still do not think I would go there or miss there again. (Participant 3)"

> "I never miss there. I get used to living in a society of 'individualism' in South Korea. I do not understand how I lived in traditional and communist rules in NK. (Participant 19)"

In addition, examples of the lowest score for "Orientation" (meaning that they do miss NK) are shown below.

> "Sometimes I regret coming here. I want to go back there. I should have lived in North Korea and ended up living there. I should have not come here. I really want to go back and meet my old friends and my family, but I just cannot. If I do, I will be killed and my whole family will be massacred. I know freedom is good, but freedom makes people competitive at the same time. I cannot say communism is the best; however, I have to say it makes the society more peaceful and calmer (Participant 2)"

> "I miss my parents so badly. They sometimes appear in my dream. I also had a lover in my hometown. I miss him so much and think of him often. He also appears in my dream. I often wake up with tears in the morning because I miss everything there. (Participant 12)"

The **Assimilation** category includes general attitudes toward SK and NK, satisfaction of living in SK and interaction with SK people. Below are examples of the highest score for "Assimilation".

> "I am shocked because people in SK are a lot better than I imagined. In NK, we learned that SK people were evils of capitalism. When I arrived here, SK people

were dedicated to help me adapt here. SK people are much better than people in NK, much more friendly, kind, and warm-hearted… It is capitalism. Capitalism means richer and better life. Also, it means I have more opportunities to earn money and for education. Opportunity is limitless. I can pursue anything I want here… Culture is rich, K-pop songs, movies, dramas… I can even watch programs from overseas too. These days, South Korean culture is so well-known abroad… In NK, it was just about communism spirit, political propaganda movies and songs. I was sick of listening to news telling me how much Kim's family was wonderful and almighty (Participant 5)"

"I am a huge fan of the SK girl group, Black pink. In NK, I was only able to listen to communist propaganda songs. K-pop and culture here are more sophisticated and various. I enjoy listening to K-pop and watching dramas and movies… The best thing in SK is that I can pursue my dream and career. In NK, I just had to do what the NK government wanted me to do. However, here, I can study anything I want and learn anything I am interested in… I can broaden my personal relationships here a lot. I can meet many people from various events and gatherings and make many friends… In NK, I only interacted with my family and neighbors. However, here, I can make friends from various fields… I get to learn SK cultures naturally and love to live here. Freedom is definitely the best thing which I could never have in NK. (Participant 15)"

Examples of lowest Assimilation score are described below.

> "I was a better person in NK. I was confident and outgoing. I was very active and had more friends than here. I thought I was the best there. However, here, I become so quiet, timid, and passive. I just do not want to make my voice… SK people are selfish, and they only live for themselves. People here do not care for others. It is not that quality of people that deserves to be in a developed country… I cannot adapt in SK society. People here do not understand me… (Participant 2)"

> "It has been bad since I got here. I have to accept this terrible reality. It may become better one day, but I am hopeless… I do not have any free time, literally, I have no time. Nothing goes right… I do not have any money so I cannot meet friends or make friends. It is miserable. My mom gets sick here… My situation is totally different from others. I cannot enjoy my life here… I only interact with friends from my hometown… (Participant 4)"

Language attitude was assessed based on the NK speakers' answers how they feel about using NK and SK language and acquiring SK. First, an example of the highest score of Language attitude is presented below.

> "SK language sounds more affectionate and friendly… While I was watching SK dramas, I repeated lines in the dramas. I practice hard to speak like people from Seoul… I would say 'When in Rome, do as the Romans do'. It is important to fix NK way of speaking and to acquire SK… I do mind using NK dialect because it sounds aggressive. If you learn SK, you can do whatever you want without any restrictions. No one can stop a person who speaks SK fluently. If you acquire it, you can be successful and professional. (Participant 3)"

Below are examples of the lowest score for Language attitude. Interestingly, all six male NK speakers responded that they preferred to use NK dialect because SK sounded too feminine. Below are example answers from three of the six male NK speakers.

> "As a NK man, SK sounds too feminine and childish. It sounds weird actually… Speaking NK is much more comfortable to me. NK sounds more masculine and stronger. I like it… If I am not able to speak NK or forget how to speak NK, it means I lost my NK identity. In that case, no one will notice that I am from NK. It is strange to me. I think it is better to show that I am from NK, using NK dialect. (Participant 5)"

> "I do not know how to explain but I do not want to learn SK. I do not understand why SK has to have loan words. It just sounds too cute. I prefer using NK dialect. It sounds better. (Participant 6)"

> "My SK friends told me NK dialect sounded cool and masculine. In my case, speaking NK is not an obstacle to live in SK. Even SK strangers are nice to me and treat me better when I speak NK dialect. (Participant 19)".

The participants in this study also responded to **language attitude survey**. This survey, based on Preston (2002) and Park (2002b), included four sections just like the categories set up for the interview responses: (i) identity towards SK and NK, (ii) orientation toward NK, (iii) assimilation toward SK, and (iv) language attitude towards SK and NK. Participants responded to each item in these categories using a six-point Likert scale.

The identity section asked the extent to which they have stronger identity towards either NK or SK. Orientation section asked the extent to which they miss life, people, and culture in NK. Assimilation toward SK included questions regarding how they regularly interacted with SK locals for integrated purposes, and the extent they would like to be assimilated and adapted in SK society. The language attitude section has questions regarding how they perceive NK and SK varieties. For instance, the questionnaires ask to what extent the SK variety sounds intelligent, friendly, polite, snobbish, correct, trustable, normal, and feminine.

Overall Language attitude score was calculated by subtracting Language attitude score towards SK with Language attitude score toward NK. Thus, like the score system in the sociolinguistic interview, a higher Language attitude score implies a more positive attitude towards SK and a lower Adaptation attitude score shows a more positive attitude towards NK but a more negative attitude towards SK. The Adaptation survey is attached in **Appendix II**.

3.3. Relationship among the Adaptation categories

I address the second research question first before the first research question, by way of examining interrelationship among the adaptation categories that I have established above and also examining the collinearity of the factors prior to regression analyses.

(2) To what extent do the effects of Identification, Orientation, Assimilation and Language Attitude relate to each other?

According to Siegel (2010) and Nycz (2019), these four factors have complicated relationship. First, Siegel (2010) showed that (language) attitude can be highly related to 'willingness for assimilation (see also Chapter I). In addition, Nycz (2019) reported that 'willingness for motivation' was related to 'regular interaction with locals in D2' (see also Chapter I). However, because Nycz (2019) did not assess relations among language attitude, willingness for motivation, and regular interaction with locals in D2, it was unclear how her participants could have more frequent regular interaction with locals in D2. The participants' positive attitudes toward D2 variety in Nycz (2019) might have led to the speakers' higher motivation for and more frequent interaction with D2 locals. Based on the previous literature, I predicted that Language attitude may be positively correlated with Identification, Orientation, and Assimilation score. In other words, if NK speakers have positive attitudes toward SK variety, they may identify themselves as South Korean, and be more assimilated and more oriented in South Korea.

Table 3.3.1. presents the relations among each factor, showing that all four factors are significantly correlated to each other. However, the direction of some of the correlations was different from what I had expected, and the degree of correlation also varied. In more detail, Orientation and Assimilation are correlated the most (0.98). The more the NK speakers did not miss NK, the more they well-adjusted in SK. Such a strong correlation suggests that the questions in Orientation and Assimilation categories addressed the same dimension. Given this, I decided to combine the items in the two categories and use the label Assimilation in the subsequent analyses.

Next, Orientation and Identification are negatively correlated (-0.23). In addition, Assimilation and Identification were also negatively correlated (-0.16). These results

indicate that the more NK speakers identify themselves as SK speakers, the less they were oriented toward SK and the less they were assimilated in SK. These results were unexpected, but it may reflect the complicated situation in which NK speakers find themselves: they may identify themselves as SK speakers as they have chosen to live as a citizen in South Korea; however, that may not mean that they are easily adjusted to the South Korean culture. Conversely, they may be very happy living in South Korea, escaping the hardship in North Korea; however, they may not be willing to do away with their North Korean identity.

Language attitude was also negatively correlated with Orientation and Assimilation (-0.17 and -0.14, respectively). However, Language attitude was positively related to Identification score (0.43). These results were contrary to my prediction that Language attitude would be positively correlated with all other factors. The results mean that the more the NK speakers have positive attitude toward SK variety, the more they are likely to have SK identity and the less they are likely to assimilate in and orient toward SK. Again, the exact explanation for these results is unknown; however, it may reflect the complicated political and emotional situations in which the NK speakers are placed.

More importantly for the present analysis, whereas the four factors were reliably correlated with each other, the degree of correlation was not very strong, except for that of Orientation and Assimilation. The results, therefore, appear to support the idea that categories of Identification, Assimilation and Language attitude, while overlapping slightly, capture some different aspects of the speakers' stance.

Table 3.3.1. Correlation matrix I

Variable	*M*	*SD*	1	2	3
1. Identification	0.54	1.09			
2. Orientation	4.38	3.86	-.23** [-.25, -.21]		
3. Assimilation	4.87	4.17	-.16** [-.19, -.14]	.98** [.98, .98]	
4. Language attitude	-0.22	6.25	.43** [.41, .45]	-.17** [-.19, -.15]	-.14** [-.17, -.12]

Next, correlation between the interview scores and survey scores were examined. **Table 3.3.2.** shows that interview and survey scores were significantly correlated. Each category in the interview is correlated with each category of the survey as indicated by the bold r values in the table. For example, a participant with higher Identification score in the interview also had higher Identification in the survey (r = .08). Although the correlation was weak for Identification, it was fairly strong for the other categories. Given these correlations, I decided to only use scores from interviews for the subsequent analyses. Another reason to support the decision is that the survey had missing data because the first four participants did not finish the survey after the interview.

Table 3.3.2. Correlation Matrix II

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Identification	0.54	1.09							
2. Orientation	4.38	3.86	-.23** [-.25, -.21]						
3. Assimilation	4.87	4.17	-.16** [-.19, -.14]	.98** [.98, .98]					
4. Language attitude	-0.22	6.25	.43** [.41, .45]	-.17** [-.19, -.15]	-.14** [-.17, -.12]				
5. Survey Identification	3.14	2.31	**.08**** [.06, .11]	.27** [.24, .29]	.27** [.25, .30]	-.13** [-.16, -.10]			
6. Survey Orientation	6.22	2.89	-.16** [-.18, -.13]	**.61**** [.59, .63]	.66** [.65, .68]	-.03 [-.05, .00]	.22** [.20, .25]		
7. Survey Assimilation	6.61	3.15	-.16** [-.18, -.13]	.63** [.61, .64]	**.68**** [.67, .70]	-.04** [-.07, -.01]	.29** [.27, .32]	.98** [.98, .98]	
8. Language attitude	0.91	4.81	.56** [.54, .58]	-.02 [-.05, .00]	-.00 [-.03, .02]	**.79**** [.78, .80]	.15** [.12, .18]	.03* [.01, .06]	.07** [.04, .10]

3.4. Analysis of AoA, LoR, Adaptation scores and VOT and F0

This analysis addresses the first research question.

(1) To what extent do AoA, LoR, and Adaptation scores (identity, orientation, assimilation, and language attitude) affect VOT and F0 of NKs' stops?

All analyses pertaining to the research question were performed using mixed effect linear regression (Baayen et al., 2008) as implemented in the lme4 package (Bates, Mächler, Bolker, & Walker 2015) in the R environment (R Core Team, 2020). I included AoA, LoR, and all categories of Adaptation scores (Identification, Assimilation, and Language attitude). Note that the Orientation scores are now included in the Assimilation. The model analyzing each acoustic cue (VOT and F0) included Manner of stops (Lenis, Aspirated, categorical factor, dummy coded, with Lenis as the reference) and interaction with AoA, LoR, Identification, Assimilation, and Language attitude scores (continuous variable) as fixed effects. The model examining VOT included articulation rate (continuous variable) as a predictor to control for its influence on VOT. Scale function in R was used to standardize AoA, LoR and each score of Adaptation scores.

All models included a random intercept for Word, as it was possible that dependent measures varied by lexical context. A random intercept for Speaker was also added. All models included a random slope for Stop by Speaker because by-speaker variation in the dependent variable could be conditioned by stop type. Stop and Speaker in the random effects were uncorrelated to aide convergence.

Because the models include a large number of predictors and controls to address the research question a single best fit model fails to describe model selection uncertainty. To address the issue, I employed the method of multimodel inference of Burnham and Anderson (2002). This method averages the coefficients associated with a predictor across all possible alternative models, weighting the coefficient estimate from each model by the probability of that model being the most predictive one. The models varied from

one having zero predictors (the intercept-only model) to the model including all of predictors.

Specifically, dredge() function from the MuMIn package (Barton, 2020) was used to create and fit models corresponding to all subsets of predictors from the full models in (1) and (2). The model averaging (model.avg) function in the package was used to evaluate predictors by averaging coefficients across the models fit by dredge(). The sw() function was then used to calculate predictor importance, i.e., the probability that each predictor needs to be included in the most predictive model. Predictor importance addresses the aim of this chapter to find the most predictive factor among AoA, LoR, Identification, Assimilation and Language attitude scores. The results of the full model (1 ~ 2) as well as the results from model averaging will be described in the next section.

7) VOT ~ Stop*(scale(AoA)+scale(LoR)+scale(Identification) + scale(Assimilation)+ scale(Language attitude)) + scale(Articulation rate) + (1+ Stop|| Participants) + (1+scale(AOA)+scale(LOR)+ scale(Identification) + scale(Assimilation)+ scale(Language attitude)||Word)
8) F0 ~ Stop*(scale(AoA)+scale(LoR)+scale(Identification) + scale(Assimilation)+ scale(Language attitude)) + (0+ Stop|| Participants) + (1+scale(AOA)+scale(LOR)+ scale(Identification) + scale(Assimilation)+ scale(Language attitude)||Word)

3.5. VOT results

3.5.1. Overall results

First, Model (1) was run. Next, dredge() function was used. Results of dredge() showed that the best fit model includes all factors of AoA, LoR, score of Identification, Assimilation, and Language attitude to predict VOT production. **Table 3.5.1.1**. illustrates results of Model (1). First, statistical results presented that AoA can marginally predict VOT production ($p = 0.086$). Second, LoR can predict VOT production significantly ($p = 0.022$). In addition, Assimilation appeared marginally significant ($p = 0.075$).

Moreover, as noted in section 3.4., the model averaging (model.avg) function in the package was used to evaluate predictors by averaging coefficients across the models fit by dredge(). Furthermore, to examine predictor importance, the sw() function was used. The results are shown in **Table 3.5.1.2** and **Table 3.5.1.3**, respectively. Thus, whereas the results of Model (1) (Table 3.5.1.1) are presented for the sake of transparency, the results of model averaging (**Table 3.5.1.2** and **Table 3.5.1.3**) present more conservative and correct findings in terms of factor weights in the model. Therefore, only the latter results are interpreted. In the latter results, the main effects of Articulation rate and Manner were significant ($p < 0.001$ and $p < 0.001$, respectively) and the main effect of LoR was marginally significant ($p = 0.0818$); however, what is critical to our research question is the significant Manner x Factor interactions. The interaction between Manner and LoR was significant ($p < 0.01$) and the interaction between Manner and Identification score was marginally significant ($p = 0.083$) (Table 3.5.1.2). The coefficients indicated LoR predicted more SK-like VOT patterns significantly and

Identification was the second most important factor that predicted more SK-like VOT production (Table 3.5.1.2). The sum of weights for LoR and Identification are .98 and .92 respectively (Table 3.5.1.3), indicating that LoR has 98% of probability and Identification has 92% of probability in the most predictive model for SK-like VOT production. Although the Manner x Identification was marginally significant, I note that the analysis adopted is conservative and the weight for LoR is robust. These results suggest that LoR is the most important predictor and Identification is the second most important predictor. The longer NK speakers lived in Seoul and the stronger SK identity they had, the more they could produce D2 patterns (see **Figure 3.5.1.1**). Along with the longer LoR, the Identification score was the second significant factor. This, even with the shorter LoR, the NK speakers still might be able to acquire and produce SK-like stop patterns if they had stronger SK identity (see **Figure 3.5.1.2**). Unlike findings in previous studies (Stanford, 2008; Kang & Yun, 2018), AoA was not a significant factor.

Table 3.5.1.1. The Output of Model (1) for the best fit model

		VOT	
Predictors	*Estimates*	*CI*	*p*
(Intercept)	40.66	38.00 – 43.31	**<0.001*** **
Aspirated	33.45	30.37 – 36.54	**<0.001*** **
AoA	0.04	-3.20 – 3.28	0.982
LoR	2.43	-0.85 – 5.71	0.146
Identification	-0.66	-3.76 – 2.45	0.677
Assimilation	-0.45	-2.87 – 1.98	0.718
Language attitude	2.28	-0.77 – 5.33	0.143
Articulation rate	-10.26	-10.80 – -9.72	**<0.001*** **
Aspirated * AoA	3.02	-0.43 – 6.46	**0.086.**
Aspirated * LOR	-4.09	-7.59 – -0.58	**0.022***
Aspirated * Identification	-2.79	-6.11 – 0.53	0.100
Aspirated * Assimilation	2.41	-0.24 – 5.06	**0.075.**
Aspirated * Language attitude	-1.82	-5.11 – 1.48	0.280

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 3.5.1.2. The Output of averaging model coefficient

Model-averaged coefficients: (full average)	Estimate	Std. Error	Adjusted SE	z value	Pr(>|z|)
(Intercept)	38.4234	1.3360	1.3363	28.754	<2e-16 ***
Aspirated	35.8598	1.4301	1.4304	25.070	<2e-16 ***
AoA	0.7468	1.8041	1.8044	0.414	0.6790
Articulation rate	-8.5147	0.2504	0.2505	33.992	<2e-16 ***
Assimilation	0.2504	1.1888	1.1890	0.211	0.8332
Identification	-0.3168	1.7408	1.7411	0.182	0.8556
Language attitude	1.3617	1.5346	1.5348	0.887	0.3750
LoR	3.1520	1.8111	1.8113	1.740	**0.0818 .**
Aspirated*AoA	2.1439	1.9115	1.9117	1.121	0.2621
Aspirated*Assimilation	0.9494	1.2960	1.2962	0.732	0.4639
Aspirated*Identification	-3.2194	1.8566	1.8569	1.734	**0.0830 .**
Aspirated*Language attitude	-0.9128	1.5330	1.5332	0.595	0.5516
Aspirated*LoR	-5.0881	1.9420	1.9423	2.620	**0.0088 ****

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 3.5.1.3. The Output of weights of each factor

	Manner	Articulation rate	AoA	LoR	Identification
Sum of weights	1.00	1.00	1.00	1.00	1.00
N containing models	486	275	365	365	356

	Assimilation	Language attitude	Manner*AoA	Manner*LoR
Sum of weights	0.95	0.80	**0.82**	**0.98**
N containing models	356	356	162	162

	Manner*Identification	Manner*Assimilation	Manner*Language attitude
Sum of weights	**0.92**	0.66	0.56
N containing models	162	162	162

Figure 3.5.1.1. Predicted Values of VOT by LoR

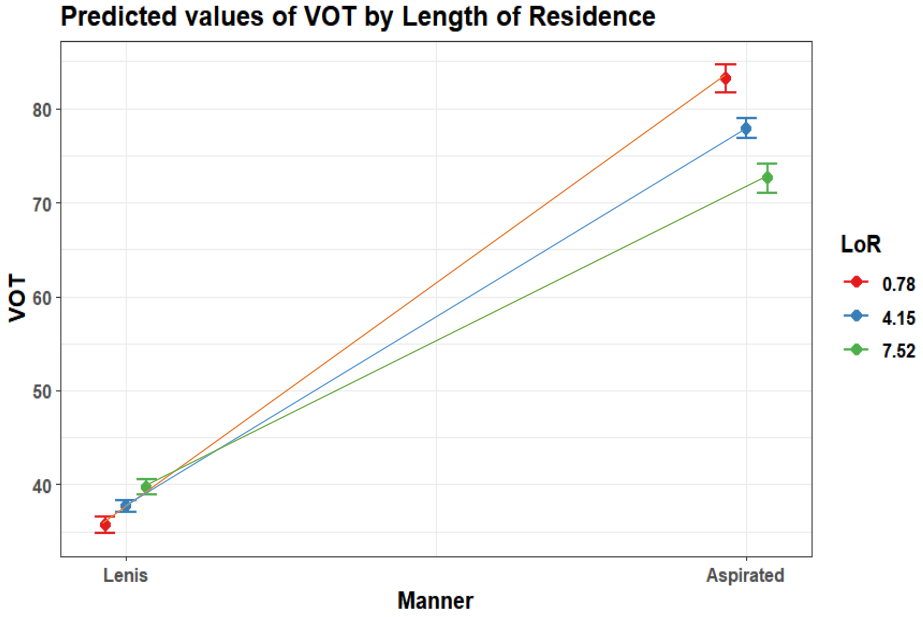
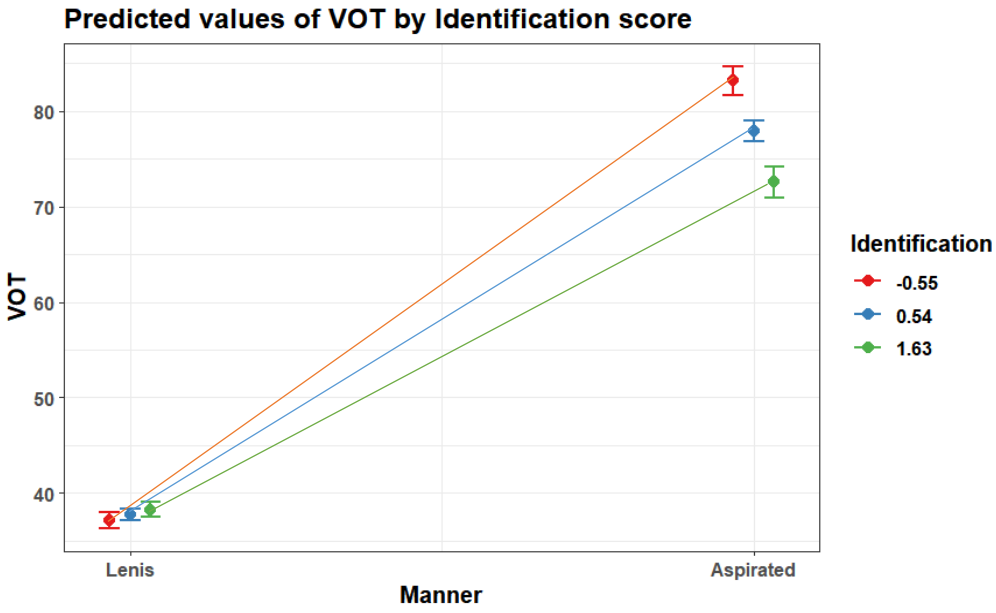


Figure 3.5.1.2. Predicted Values of VOT by Identification score



3.5.2. Individual patterns

I noticed that there were some participants who showed extraordinary patterns. More specifically, some participant assimilated VOT of lenis and aspirated (like SK) even if they stayed in Seoul for only one year. In contrast, there was a participant who did

not assimilate VOT of lenis and aspirated stops even when he stayed in Seoul for ten years. These cases prompted me to conduct exploration of the pattern of VOT production further. In addition, in the previous research (Nycz, 2019; Siegel, 2010), Assimilation and Language attitude were important predictors. However, unlike the previous literatures, the results in the last section did not show the importance of Assimilation and Language attitude. To examine how the NK speakers who showed extraordinary patterns responded to the questions asking Identification, Assimilation, and Language attitudes, the individual responses are examined below. This section addresses the third research question with regards to VOT.

(3) What are the characteristics of NK speakers who show strong assimilation and dissimilation to the SK pattern of stop production?

First, I divided the NK speakers into VOT assimilator and dissimilator groups based on the mean of VOT difference. As shown in Chapter II (and also in **Table 3.5.2.1**), difference between SKs' VOT for lenis and aspirated was only 6 ms on average, but no NK participants differentiated VOT of lenis and aspirated stops with such a small difference. NK speakers' mean VOT difference across lenis and aspirated was 40ms. Thus, I divided the NK participants using VOT 40ms, between VOT assimilators (thus, producing more SK-like stops) and VOT dissimilators (thus, producing more NK-like stops) (see **Table 3.5.2.2**). Three NK participants whose VOT difference was between 40ms and 41ms were excluded. This left 8 speakers in the VOT assimilator group and 11 in the VOT dissimilator group. To examine if the mean of VOT difference is significantly different between the two groups, two-sample t-test was run. Results of the t-test confirmed that the mean VOT difference of VOT assimilator group (M=29, SD=10)

was significantly different from that of VOT dissimilator group, (M=47, SD=5), $t(10.464) = -5.4786$, $p = 0.0002$. While the assimilators mean is still distant from that of SK speakers (6 ms), assimilators seem to form a group different from the dissimilators.

Previously, it has been reported that four to five years of LoR are required to acquire D2 variables (Chambers, 1992; Foreman, 2003). Most participants in dissimilator group lived in Seoul for less than four years, which is consistent with those findings and the results of model (1). However, the three participants (Participant #8, 17, 18) showed VOT difference less than 40 ms (37-39ms), thus placed in the VOT assimilator group, even though they have only lived in Seoul for less than three years. In contrast, Participant 20 was grouped as VOT dissimilator with VOT difference 42 ms despite having lived in Seoul for ten years. Although their VOT values are similar, the difference in their LoRs is noteworthy. Thus, it is worth noting that LoR is not the only significant factor in SK-like VOT production.

Table 3.5.2.1. presents each mean of VOT in lenis and aspirated and difference of VOT between lenis and aspirated in each group. Demographic information of those assimilators and dissimilators are illustrated in **Table 3.5.2.2**. and **3.5.2.3.**, respectively. To examine patterns in their responses, the notable interview responses from Speaker #8, #17, #18 (extraordinary VOT assimilators) are presented first and the responses from Speakers #20 (extraordinary VOT dissimilator) are shown below.

Table 3.5.2.1. Information of VOT in each group

	Mean VOT of Lenis (SD)	Mean VOT Aspirated (SD)	VOT difference
General NK (n = 22)	38ms (20ms)	78ms (25ms)	40ms (12ms)
General SK (n = 22)	63ms (16ms)	69ms (21ms)	6ms (3ms)
NK assimilators (n = 8)	41ms (23ms)	70ms (26ms)	29ms (10ms)
NK dissimilators (n = 11)	36ms (18ms)	83ms (23ms)	47ms(5ms)

(SD of mean VOT is in the parenthesis)

Table 3.5.2.2. Demographic information of VOT assimilators

Participant number	Gender	Age	AoA	LoR	mean of VOT difference
1	F	24	14	10	16ms
2	F	24	14	10	35ms
3	F	24	16	8	24ms
6	M	18	14	4	28ms
7	F	22	17	5	17ms
8	**F**	**19**	**17**	**2**	**39ms**
17	**F**	**23**	**22**	**1**	**38ms**
18	**F**	**20**	**19**	**1**	**37ms**
Mean	**N/A**	**21.8**	**16.6**	**5.1**	**29ms**

Table 3.5.2.3. Demographic information of VOT dissimilators

Participant number	Gender	Age	AoA	LoR	mean of VOT difference
4	F	24	23	1	61ms
5	M	23	21	2	49ms
10	F	19	16	3	45ms
11	F	26	24	2	46ms
12	F	26	25	1	45ms
13	F	32	31	1	42ms
14	F	26	24	2	49ms
16	F	18	17	1	53ms
19	M	16	13	3	45ms
20	**M**	**31**	**21**	**10**	**42ms**
22	M	20	19	1	56ms
Mean	**N/A**	**22.3**	**21**	**2.5**	**47ms**

3.5.3. VOT assimilators

The three participants (#8, 17, and 18) showed more SK-like VOT patterns even though their LoR was 2 years or less (mean VOT difference = 39ms, 38ms, 37ms respectively). It was noted that the three participants showed high Identification, Assimilation, and/or Language attitude scores. For example, the example below shows participant 18's response to an **identity** question, which indicates her strong SK identity.

"To adapt in SK community better, I try to consider myself as SK. The more I think that I am just a common SK person, I feel that I have the same right for

pursuing freedom as other SK people… I like to have more SK identity than NK identity (Participant 18)."

In terms of **Assimilation**, all three participants showed positive attitudes towards SK but more negative attitudes towards NK.

"I love sports in SK. I could not enjoy any sports at all in NK. I become a huge fan of Dusan baseball team here… I love living here because of the culture in SK. I love movies, musicals, music and so on. I was surprised when I watched Marvel movies here. All the CG effects, story lines, characters… I also got to love foods here, foods from all over the countries… I want to be a police officer here and it has been my dream job. But I just could not do it in NK because of stupid political party. I am happy that I can finally achieve my dream in SK… There are always fun and nice events every day here… In NK, it was too dangerous and life threatening. I never think it is safe to live. My town had murder cases, so I was always afraid of walking at night… They are so conservative and traditional. They think a husband or boyfriend must be older than a wife or girlfriend. I do not understand… All the facilities were outdated and so old. Schools were almost broken, and toilets were horrible. I hated it. (Participant 8)"

"My favorite thing here is the amusement park. I love going Everland and riding rollercoasters. I also like watching dramas. I am a big fan of Yu Ah-In… I watched tons of SK dramas in NK for more than ten years. You would not imagine. I literally watched everything… My neighborhood here is great… I also love that I can do anything, and I can be anything here. I wanted to be a teacher,

but I could not in NK. I am so glad that I have freedom to choose my own career… I really love individualism. I was sick of all the collective behaviors in NK. No one judges anything here. I like everything here… NK is so corrupted. You can just pay money to be a doctor. Teachers only care about students who pay money. It is not fair at all. It was so hard to escape there. I could not even go outside… They censor your outfits, color of shirts, design of clothes. I had to wear long sleeves even in summer because of the stupid censorship… They even regulate your hair style. I cannot believe how I lived there. (Participant 17)"

"I love music in SK, especially, ballad music moves my heart… I want to adapt in SK university. I love the fact that I can study what I want and improve my disadvantages by learning… I registered for many tutoring programs to improve myself. I love it. I could not improve myself in NK. It was almost impossible… I try my best to adapt in SK community… In NK, I did not like the roads, streets, and pedestrian roads. Road equipment was so poor. Because of it, people could not go to work or school and could not visit other cities. (Participant 18)"

In the interview, they also expressed strong positive attitudes towards SK variety and acquiring SK variety. Below are examples of their responses in **Language attitude**.

"I try my best not to use NK dialect. I practice speaking in Seoul standard language every day before I sleep… Now, I think I got a lot better than before. How do you think? I search on YouTube to learn how to speak like Seoul Korean and practice intonation. (Participant 8)"

"As I told you, I literally watched all dramas in SK. I have practiced speaking Seoul standard for a long time… I personally do not like NK dialect. It sounds so aggressive, weird, and too masculine. (Participant 17)"

"Every time I watch SK dramas, I repeat lines in the dramas. In my daily life, I ask my SK friends if I did not sound like SK people. While I am talking with them, I think before I speak and try to fix my NK accents… I love learning SK language… I try my best not to use NK dialect. (Participant 18)"

In sum, although Assimilation and Language attitude were not important predictors in the results, the NK speakers, who showed extraordinarily assimilation to SK-like VOT, positively responded to the three categories. Due to their positive stance towards SK identity, assimilation, and SK language, they might be able to assimilate VOT patterns even with the shorter LoR.

3.5.4. VOT dissimilator

Participant #20 has lived in South Korea for 10 years, but his VOT (Lenis: 40ms and Aspirated: 82ms) looks far away from that of SK stops. His interview responses suggest some struggles and conflicts related to identity and adapting to living in South Korea. For example, he appears to have a conflicted feeling about adapting an SK identity.

"It is very uncomfortable to answer your question. It is not that I want to have a NK identity. However, I just have to have NK identity because I was born there. NK identity is not a thing that I can easily get rid of. NK identity is just there and will be

inside of me forever… It is also very unnatural to have SK identity out of nowhere. I am not from SK."

Participant 20 also expressed that he was harshly discriminated in SK. He answered that it was traumatic and very hard to move on. Examples of his responses to **Assimilation** questions are presented below.

> "I am sick of SK people asking me if I am from China or I am Cosencok… I hate it. I do not understand why SK is good to live. It is very limited to expand relationship here… I hate the politicians and corrupted government here… Some people are just takers. I do not understand why they take others' benefits without trying hard and making efforts… (Participant 20)"

His responses to **Language attitude** questions were very notable too. Rather than voluntary acquisition of SK, Speaker #20 expressed that he had to fix his accent even though he did not want to, because of SK people. In addition, he negatively described his experiences and SK people who judged his accents.

> "I tried hard to acquire SK. I thought it's a great way to avoid all the questions from SK people. When people asked me where I was from, it took much time to explain everything. SK people are interested a lot in how I escaped NK, why I came to SK, how my life was in NK and so on. But you know, in a professional setting, it is just a waste of time. For example, it is not that my hometown accent is purposeful at work or in a meeting. However, people just ask me endless unnecessary questions about my hometown and accent. I am fed up with it. So, I want to change it and am trying hard… But, still, when I use formal endings like

~ipnida or ha-ye-ss-upnida, people still detect it and ask me questions. It is so hard. I don't like it (Participant 20)"

In sum, the extraordinary dissimilator showed quite strong negative attitudes towards SK identity, SK assimilation and SK language. Thus, even with the longer LoR, the negative attitudes towards the three categories might block the D1 speakers from acquiring D2 features. I also note that he is one of the extraordinary F0 dissimilators as shown below.

3.6. F0 results

3.6.1. Overall results

First, Model (2) was run. **Table 3.6.1.1.** illustrates results of Model (2). First, statistical results presented that AoA, LoR, Identification, and Language attitude score can predict F0 production significantly ($p < 0.001$, $p < 0.001$, and $p < 0.001$, respectively). Assimilation score did not affect the NKs' F0 production.

Moreover, as noted in section 3.4., the model averaging (model.avg) function in the package was used to evaluate predictors by averaging coefficients across the models fit by dredge(). Furthermore, to examine predictor importance, the sw() function was used. The results are shown in **Table 3.6.1.2** and **Table 3.6.1.3**, respectively. Thus, whereas the results of Model (1) (**Table 3.6.1.2**) are presented for the sake of transparency, the results of model averaging (**Table 3.6.1.2** and **Table 3.6.1.3**) present more conservative and correct findings in terms of factor weights in the model.

Therefore, only the latter results are interpreted. In the latter results, the main effects of Manner and Language attitude were significant ($p < 0.001$ and $p < 0.01$, respectively); however, what is critical to our research question is the significant Manner x Factor interactions. The interaction between Manner and Language attitude was significant ($p < 0.001$). Moreover, the significant interaction between Manner and LoR was found ($p < 0.01$) (**Table 3.6.1.2**). Thus, among all the factors, Language attitude and LoR significantly predicted more SK-like F0 production (**Table 3.6.1.2**.). The sum of weights for Language attitude and LoR were 1.0 and 0.97 respectively (**Table 3.6.1.3**), indicating that Language attitude predicts 100% and LoR predicts 97% of SK-like F0 production. Thus, Language attitude was the most important predictor (Language attitude*Aspirated = 1.00, **Table 3.6.1.3**.). It is noteworthy that Language attitude score outperforms LoR to predict the NKs' more SK-like F0 production. Thus, the NK speakers with more positive language attitude toward SK (see **Figure 3.6.1.1.**). Along with the positive language attitude toward SK, LoR was the second important predictor (see **Figure 3.6.1.2)**. This, even with the shorter LoR, the NK speakers with positive language attitude toward SK still can acquire produce SK-like F0 patterns. Unlike the previous literature, AoA and Assimilation were not an important predictor in F0 production. AoA was only the third ranked important factor predicting D2 patterns. Assimilation was not an important factor. More importantly, unlike Identification was the second ranked important predictor for SK-like VOT production, in terms of F0, Identification was also very unimportant factor predicting SK-like F0 patterns.

Table 3.6.1.1. Output of Model (2) for the best fit model

		F0	
Predictors	*Estimates*	*CI*	*p*
(Intercept)	0.95	0.95 – 0.96	<**0.001*****
Aspirated	0.28	0.26 – 0.29	<**0.001*****
AoA	-0.01	-0.02 – -0.00	**0.004***
LoR	-0.01	-0.02 – -0.00	**0.011***
Identification score	-0.00	-0.01 – 0.00	0.176
Assimilation score	0.00	-0.00 – 0.01	0.649
Language attitude score	-0.01	-0.01 – 0.00	0.155
Aspirated * AoA	0.03	0.01 – 0.04	<**0.001*****
Aspirated * LoR	0.04	0.02 – 0.05	<**0.001*****
Aspirated * Identification score	0.03	0.02 – 0.04	<**0.001*****
Aspirated *Assimilation score	0.00	-0.01 – 0.01	0.564
Aspirated * Language attitude score	0.03	0.02 – 0.04	<**0.001*****

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 3.6.1.2. The Output of averaging model coefficient

Model-averaged coefficients: (full average)	Estimate	Std. Error	Adjusted SE	z value	Pr(>|z|)
(Intercept)	9.557e-1	2.911e-03	2.912e-03	328.887	< 2e-16***
Aspirated	1.948e-01	5.090e-03	5.091e-03	38.264	< 2e-16***
Language attitude	-8.562e-03	3.079e-03	3.080e-03	2.780	**0.00544****
LoR	-2802e-03	4.027e-03	4.027e-03	0.696	0.48652
Aspirated*Language attitude	4.640e-02	6.100e-03	6.100e-03	7.605	**< 2e-16****
Aspirated*LoR	2.754e-02	9.768e-03	9.769e-03	2.819	**0.00481****
AoA	-2.436e-03	4.476e-03	4.476e-03	0.544	0.58623
Aspirated*AoA	6.583e-03	1.174e-02	1.174e-02	0.561	0.57487
Identification	3.431e-05	9.376e-04	9.376e-04	0.037	0.97081
Aspirated*Identification	4.095e-04	3.159e-03	3.159e-03	0.130	0.89686
Assimilation	1.060e-05	2.312e-04	2.312e-04	0.046	0.96343
Aspirated*Assimilation	2.469e-07	5.171e-05	5.171e-05	0.005	0.99619

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Table 3.6.1.3. The Output of weights of each factor

	Manner	Language attitude	AoA	LoR	Identification
Sum of weights	1.00	1.00	0.25	0.98	0.03
N containing models	243	178	178	178	178

	Assimilation	Manner*Language attitude	Manner*AoA	Manner*LoR
Sum of weights	<0.01	**1**	0.25	**0.97**
N containing models	178	81	81	81

	Manner*Identification	Manner*Assimilation
Sum of weights	0.02	<0.01
N containing models	81	81

Figure 3.6.1.1. Predicted Values of F0 by Language attitude score

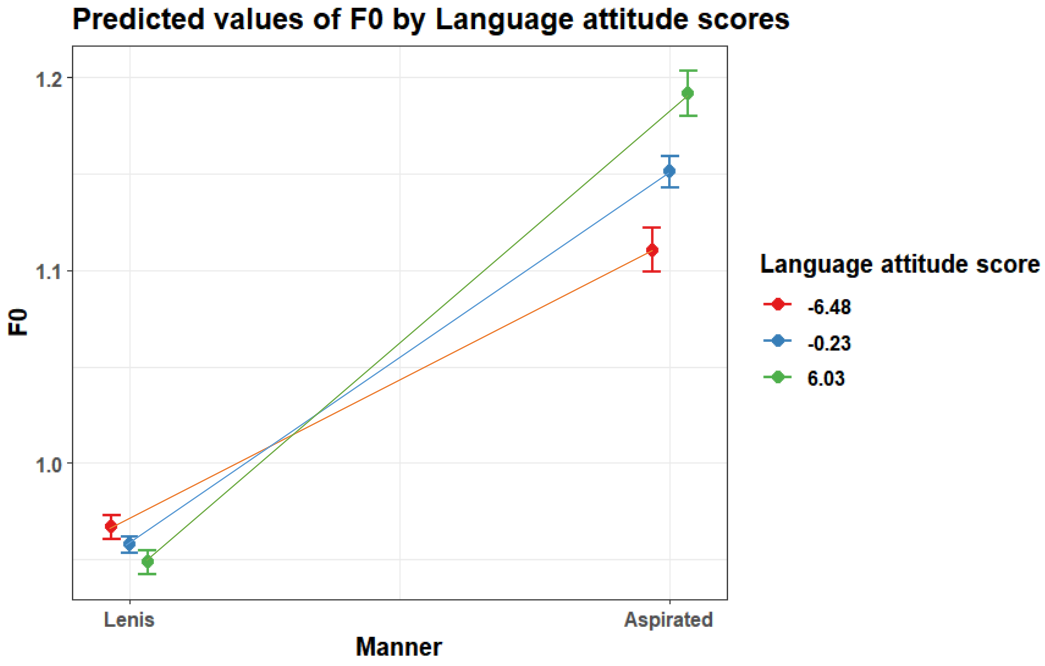
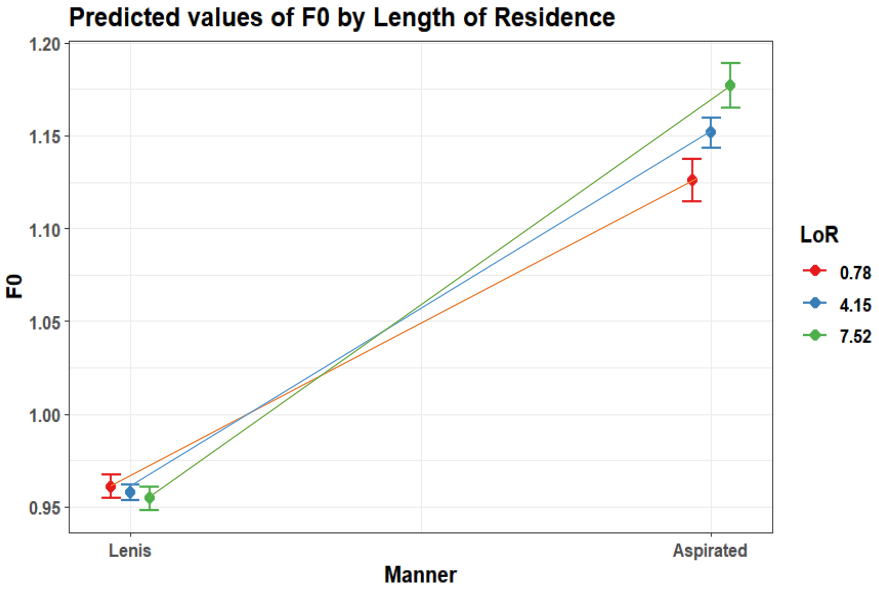


Figure 3.6.1.2. Predicted Values of F0 by LoR



3.6.2. Individual patterns

I noticed that there were some participants who showed extraordinary patterns. Specifically, some participants distinguished F0 of lenis and aspirated with a larger extent (like SK, thus, SK-like F0 assimilators) even if they stayed in Seoul for only one year. In contrast, there were participants who did not distinguish F0 of lenis and aspirated (like NK, thus, SK-like F0 dissimilators) even though they stayed in Seoul for more than four years. In addition, the previous literature (Nycz, 2019; Siegel, 2010) reported that Assimilation was an important predictor in D2 acquisition. However, unlike the previous studies, the results in the last section did not show the importance of Assimilation. To see these extraordinary groups' responses more carefully, I examined individual responses as a post-hoc exploration of the pattern of F0 production. This section addressed the third research question with regards to F0.

(3) What are the characteristics of NK speakers who show strong assimilation and dissimilation to the SK pattern of stop production?

First, I divided the NK speakers into F0 assimilators and F0 dissimilators based on the mean of F0 difference. The F0 assimilators produced stops with more SK-like F0 patterns, using larger distinction of F0 between lenis and aspirated. In contrast, the F0 dissimilators produced more NK-like stops, by distinguishing F0 less between lenis and aspirated. As presented in Chapter II, each of 22 speakers (16 females and 6 males each) from NK and SK were recruited. The difference between SKs' F0 for lenis and aspirated was 57 Hz, with such a larger distinction, but NKs' F0 difference was 42 Hz. Because the baseline of dividing the VOT assimilator and dissimilator group was NKs' mean, I also

separated the F0 groups based on NKs' mean F0 difference (42 Hz, see **Table 3.6.2.1**). The three NK participants whose F0 difference was near the mean were excluded. This left 9 speakers in F0 assimilator group and 10 speakers in F0 dissimilator group. To examine if the mean of F0 difference is significantly different between the two groups, two-sample t-text was run. Results of t-test results confirmed that both groups were significantly different from each other, $t(15.933) = 8.3611$, $p < 0.001$. Given that the assimilators' mean F0 difference is 61Hz and the dissimilators' mean F0 difference is 21Hz, assimilators seem to distinguish F0 of lenis and aspirated stops like the SK speakers and form a group different from the dissimilators.

Demographic information of those assimilators and dissimilators are illustrated in **Table 3.6.2.2.** and **3.6.2.3**, respectively. Previously, it has been reported that four to five years of LoR are required to acquire D2 features (Chambers, 1992; Foreman, 2003). Most participants in F0 dissimilator group lived in Seoul for less than three years, which is aligned with those findings and the results of model (2). However, in the assimilator group, Speakers #12, #13, #15, and #18 were included in extraordinary F0 assimilator because they still distinguished F0 although their LoR was shorter. In contrast, Speakers #6, #19, #20, and #21 distinguished F0 less even though they stayed in SK for more than four years. Thus, they were grouped in extraordinary F0 dissimilators.

In general, participant #1, 3, 7, 18 were included in both VOT and F0 assimilator group. In addition, participant # 4, 5, 16, 19, 20, 22 were included in both VOT and F0 dissimilator group. It is noted that these extraordinary assimilators and dissimilators are not totally overlapped across VOT and F0. First, only participant #18 was consistently included in both VOT and F0 extraordinary assimilator group. She has only lived in

Seoul for one year but still assimilated both cues. Next, only participant #20 was grouped in both VOT and F0 extraordinary dissimilator group. He dissimilated both cues in stops although he has lived in Seoul for ten years. Thus, except the two participants, the extraordinary assimilators and dissimilators were not consistent across VOT and F0. Because the individuals might notice the cue differently, some participants only assimilated one of cues between VOT and F0 and others may exclusively dissimilate only one cue.

To examine interesting patterns in their responses, the responses from Speakers #12, #13, #15, #18 (the extraordinary F0 assimilators) are presented first and the responses from Speakers #6, #19, #20, and #21 (the extraordinary F0 dissimilator) are shown below.

Table 3.6.2.1. Information of F0 in each group

	F0 of Lenis	F0 of Aspirated	F0 difference
General NK	192Hz (52Hz)	234Hz (77Hz)	42Hz (22Hz)
General SK	187Hz (46Hz)	244Hz (71Hz)	57Hz (20Hz)
NK assimilators	217Hz (36Hz)	278Hz (60Hz)	61Hz (12Hz)
NK dissimilators	159Hz (53Hz)	180Hz (62Hz)	21HZ (9Hz)

Table 3.6.2.2. Demographic information of F0 assimilators

Participant number	Gender	Age	AoA	LoR	mean of F0 difference
1	F	24	14	10	87Hz
3	F	24	16	8	63Hz
7	F	22	17	5	53Hz
9	F	18	14	4	56Hz
11	F	22	17	5	59Hz
12	**F**	**26**	**25**	**1**	**62Hz**
13	**F**	**32**	**31**	**1**	**60Hz**
15	**F**	**21**	**18**	**3**	**51Hz**
18	**F**	**20**	**19**	**1**	**50Hz**
Mean	**N/A**	**23.2**	**19.6**	**4.8**	**61Hz**

Table 3.6.2.3. Demographic information of F0 dissimilators

Participant number	Gender	Age	AoA	LoR	mean of F0 difference
4	F	24	23	1	32Hz
5	M	23	21	2	19Hz
6	**M**	**18**	**14**	**4**	**15Hz**
8	F	19	17	2	35Hz
16	F	18	17	1	16Hz
17	F	23	22	1	6Hz
19	**M**	**16**	**12**	**4**	**13Hz**
20	**M**	**31**	**21**	**10**	**22Hz**
21	**M**	**19**	**10**	**9**	**20Hz**
22	M	20	19	1	9Hz
Mean	**N/A**	**21.1**	**16.1**	**3.5**	**21Hz**

3.6.3. F0 assimilators

It was noted that the four F0 assimilators had high Identification, Assimilation, and Language attitude scores. The example below shows participant 13's response to an **Identity** question, which presents her strong SK identity. Speaker #18's responses appeared on page 131 but are repeated here.

> "I am South Korean. I know I was born in North Korea, but it does not matter anymore. I am now protected by the South Korean government and a legal citizen of South Korea. And, I am proud of it (Participant 13)"

> "To adapt in SK community better, I try to consider myself as SK. The more I think that I am just a common SK person, I feel that I have the same right for pursuing freedom as other SK people… I like to have more SK identity than NK identity (Participant 18)."

In terms of **Assimilation**, all four participants showed that they were assimilated well in SK society. Example answers from participant 12, 13 are presented below. Comments of participant 15 and 18 are shown on page 130 and 131, respectively but are repeated here.

> "To settle down in SK, the most important thing is making SK friends. I can learn SK language, culture, lifestyle from them… I also get helped a lot from my SK friends. Even though it takes more than 2 hours to go to SK church, I go there every Sunday to meet them. I feel better when I am mixed with SK friends. (Participant 12)"

"I was the beloved one at school. I was the youngest in the class. SK senior friends and professors always took care of me. They asked me whether I needed any help or if there are any issues in settling down. They were always willing to help me. I cannot thank them enough. I also liked them so much. Taking classes in SK was my first step to live in SK and it worked so well… I loved it… I was shocked that SK people were much more warm-hearted than I expected. I could feel that even the SK government also made so much effort for NK refugees. (Participant 13)"

"I am a huge fan of the SK girl group, Black pink. In NK, I was only able to listen to communist propaganda songs. K-pop and culture here are more sophisticated and various. I enjoy listening to K-pop and watching dramas and movies… The best thing in SK is that I can pursue my dream and career. In NK, I just had to do what the NK government wanted me to do. However, here, I can study anything I want and learn anything I am interested in… I can broaden my personal relationships here a lot. I can meet many people from various events and gatherings and make many friends… In NK, I only interacted with my family and neighbors. However, here, I can make friends from various fields… I get to learn SK cultures naturally and love to live here. Freedom is definitely the best thing which I could never have in NK. (Participant 15)"

"I love music in SK, especially, ballad music moves my heart… I want to adapt in SK university. I love the fact that I can study what I want and improve my disadvantages by learning… I registered for many tutoring programs to improve myself. I love it. I could not improve myself in NK. It was almost impossible… I

try my best to adapt in SK community… In NK, I did not like the roads, streets, and pedestrian roads. Road equipment was so poor. Because of it, people could not go to work or school and could not visit other cities. (Participant 18)"

In the interview, except participant 13, they also expressed strong positive attitudes towards SK variety and acquiring SK variety. Example responses from participants 12, 13 and 15 in **Language attitude** are presented below. Participant18's responses are shown on page 131 but are repeated here.

"I registered in a speech class to acquire SK language. However, I stopped going there because it was too expensive. I still want to learn SK language, but, in my case, it is better to meet SK friends and learn from them. I also try to practice the language through watching TV shows (Participant 12)"

"I cannot acquire SK language. I do not know any English or English letter. I do not understand loanwords and English words. On the street, there are so many English signs in shopping mall. I might figure it out in the future, but, so far, I do not know… It is easier to use NK dialect (Participant 13)"

"SK language sounds more friendly. I tried a lot to speak like SK people while watching SK dramas. I focused on intonation of SK. I also learned loan words and neologisms from the media. While I was staying in Hana institute for background check, officers there told me I did not have much of an NK accent. I got more confident. (Participant 15)"

> "Every time I watch SK dramas, I repeat lines in the dramas. In my daily life, I ask my SK friends if I did not sound like SK people. While I am talking with them, I think before I speak and try to fix my NK accents… I love learning SK language… I try my best not to use NK dialect. (Participant 18)"

In sum, the extraordinary F0 assimilators responded the questions in all three categories positively. Thus, because they had positive SK identity, assimilation, and SK language attitude, they could assimilate F0 of SK stops, by distinguishing F0 between lenis and aspirated stops, even with the shorter LoR. Participant #18 was the only extraordinary assimilator in both VOT and F0, showing more SK-like stop production. Again, because the individuals might differently notice the acoustic cues in SK stops, they may solely rely on one of cues.

3.6.4. F0 dissimilators

Interestingly, the four male NK participants out of six male speakers (Speakers #6, 19, 20, and 21) were extraordinary F0 dissimilators even though their LoR was 6.8 years on average. Their interview responses showed negative feelings about answering **Identity.** First, participants 6, 19, and 21 did not respond to the Identification questions. Thus, it was recorded as 0 in the interview score. The negative responses from participant 20 for Identification are presented on page 119 but copied below.

> "It is very uncomfortable to answer your question. It is not that I want to have a NK identity. However, I just have to have NK identity because I was born there. NK identity is not a thing that I can easily get rid of. NK identity is just there and

will be inside of me forever… It is also very unnatural to have SK identity out of nowhere. I am not from SK."

Except for Participants 6 and 20, participants 19 and 21 in the group reported that they were satisfied with living in SK and gained high **Assimilation** score. More specifically, they commented that they preferred to live in SK because of better environment, infrastructure, capitalism, and liberalism. Comments from Participants 19 and 20 are shown on pages 96 and 100, respectively but they are repeated here. The example below shows responses in **Assimilation** from Participants 6 and 21.

"I hate foods in SK. It is too sweet and smells bad. I only eat NK foods here. I can never get used to the taste of SK food… I do not like living in SK. I only have NK friends, but I still do not have many friends. When they visited their own family here, I feel jealous and upset… SK society is so competitive, and I do not understand why I should compete with others… I gave up studying and trying… I have neither dream nor hope here. (Participant 6)"

"I never miss there. I get used to living in a society of 'individualism' in South Korea. I do not understand how I lived in traditional and communist rules in NK. (Participant 19)"

"I am sick of SK people asking me if I am from China or I am Cosencok… I hate it. I do not understand why SK is good to live. It is very limited to expand relationship here… I hate the politicians and corrupted government here… Some people are just takers. I do not understand why they take others' benefits without trying hard and making efforts… (Participant 20)"

> "I am very satisfied with living in SK. I broadened my relationship here. I got so many friends from school, part-time job, and club activities… Freedom is definitely the best. I can dream of anything I want. I would like to be a mechanic and it is fun to learn mechanics here. I found my career, friends, goals, and freedom… Korean hip-hop music is so fascinating too. I never had these amazing things in NK. I love it all. (Participant 21)"

Interestingly, although half of the F0 dissimilators reported that they preferred to live in Seoul and were assimilated well in SK society, in terms of **Language attitude**, they showed negative attitudes towards SK variety and acquisition of SK. Three of four male dissimilators commented that they dislike the way of speaking in SK. They responded that SK language sounds too feminine. They commented that they did not want to acquire SK dialect because NK dialect sounded cool, masculine, and strong. Responses of participants 6 and 9 are shown in page 100 but they are repeated below. Like other male NK speakers, participant 21 also answered that he did not want to acquire it. However, he said that he acquired it naturally because he was nine. He also commented that NK dialect was masculine and strong, and SK dialect is soft. Interestingly, Participant 20 (the dissimilator of both VOT and F0 even with 10 years of LoR) expressed complicated feelings towards NK and SK variety. In common, all NK extraordinary dissimilators were male speakers and commented femininity and masculinity of SK and NK. As examples, answers from Participant 20 and 21 are also shown below.

“I do not know how to explain but I do not want to learn SK. I do not understand why SK has to have loan words. It just sounds too cute. I prefer using NK dialect. It sounds better. (Participant 6)”

“My SK friends told me NK dialect sounded cool and masculine. In my case, speaking NK is not an obstacle to live in SK. Even SK strangers are nice to me and treat me better when I speak NK dialect. (Participant 19)”.

“I tried hard to acquire SK. I thought it’s a great way to avoid all the questions from SK people. When people asked me where I was from, it took much time to explain everything. SK people are interested a lot in how I escaped NK, why I came to SK, how my life was in NK and so on. But you know, in a professional setting, it is just a waste of time. For example, it is not that my hometown accent is purposeful at work or in a meeting. However, people just ask me endless unnecessary questions about my hometown and accent. I am fed up with it. So, I want to change it and am trying hard… But, still, when I use formal endings like ~ipnida or ha-ye-ss-upnida, people still detect it and ask me questions. It is so hard. I don’t like it… Definitely, SK sounds softer and more feminine than NK. NK sounds very strong. I did not like SK at first but now I get used to listen SK (Participant 20)”

“I came to Seoul when I was nine. I already forgot NK dialect. I remember it was more like Busan dialect, very masculine and strong. I did not think that I should acquire SK dialect… I do not think that I want to learn it in the future too. I just could acquire it naturally because I came here at nine years old… Some NK

people say SK sounds too feminine. I can understand why they think it is feminine, but I think it is more like soft (Participant 21)"

In sum, it was noteworthy that the extraordinary F0 dissimilators were all male speakers and had positive assimilation to SK in general. However, they had lower Language attitude scores. In addition, participant 20 was included in both extraordinary VOT and F0 dissimilator group. Although he has lived in Seoul for ten years, he was still reluctant to acquire and produce SK-like stops and had a complicated attitude toward SK variety. It is interesting that other extraordinary F0 dissimilators did assimilate SK-like VOT patterns. Although VOT is a more subtle cue in SK, the male F0 dissimilators may voluntarily not to acquire and produce SK-like F0 patterns. They might be hesitant to raise F0 of aspirated stops because they did not want to sound feminine, while they are not hesitant to shorten VOT.

Unlike the previous literature, the positive Assimilation did not influence them to acquire F0 patterns in SK. Answers from the individual F0 assimilators and dissimilators showed that Language attitude was closely related to raising F0 of aspirated stops (like SK) in this data. This will be discussed further in the next session.

3.7. Discussion

In this chapter, factors that affect SK-like VOT and F0 production were examined, and three research questions were addressed.

(1) To what extent do AoA, LoR, and Adaptation scores (identity, orientation, assimilation, and language attitude) affect VOT and F0 of NKs' stops?

(2) To what extent do the effects of Identification, Orientation, Assimilation and Language Attitude relate to each other?

(3) What are the characteristics of NK speakers who show strong assimilation and dissimilation to the SK pattern of stop production?

First, the second research question was addressed. The results showed that except Orientation, all three factors (Identification, Assimilation, and Language attitude) tap into different aspects of adaptation, albeit with some overlaps. Assimilation and Orientation did show more overlapped dimensions. The more the NK speakers assimilated in SK society, the less they missed North Korea. Based on the results, Assimilation and Orientation were combined in the analysis. Other than this, all three factors were treated independently. However, Foreman (2003) reported that strong identification was related to AoA. In his study, the younger American and Canadian speakers arrived in D2 region (Australia), the more they developed an Australian identity and produced more Australian variants. Unlike his findings, correlation between AoA and Identification was not found in this study. LoR played as the most important in more SK-like VOT production and the second most important predictor was Identification score.

Next, relations among AoA, LoR, Identification, Assimilation, and Language attitude and SK-like stop production were examined. First, in VOT, LoR was the most important predictor in more SK-like VOT production. Specifically, the NK speakers with longer LoR could significantly better approximate VOT between lenis and aspirated. In addition, LoR was a more important predictor than AoA, which is not consistent with the findings from previous studies. Previous studies reported that LoR might not be as important as AoA to acquire D2 variants (Kang & Yun, 2018; Stanford, 2007; Foreman,

2003; Kerswill, 1994, and see also Chapter I, p. 11). Kerswell (1994) reported that participants who had lived in the D2 region for more than thirty-five years used significantly fewer D2 variants than those with similar AoA but shorter LoR. For example, in Kerswill (1994), D1 Norwegian Stril speakers did not acquire D2 Bergen variants even after living in D2 region for thirty-five to thirty-seven years. Kerswill (1994) claimed that AoA is more relevant to acquire D2 variants than LoR. More related to this current North Korean dialect study, Kang & Yun (2018) also reported that AoA was a more important factor than LoR in acquiring South Korean VOT of lenis and aspirated stops. In their study, AoA affected both VOT of lenis and aspirated stops. The younger the NK participants arrived in Seoul, the longer VOT of lenis and the shorter VOT of aspirated were produced (Kang & Yun, 2018). Unlike AoA, in their study, LoR only partially affected their North Korean speakers' VOT of aspirated stops. Different from those studies, in this chapter, LoR played a more critical role in producing more SK-like VOT and F0. Unlike research by Kerswill (1994), the effects of LoR might be significant here because LoR of the NK participants in this study is in general not very long: the longest LoR is ten years. In addition, the LoR of as many as half of the NK participants is less than three years. Kang & Yun (2018) divided shorter and longer LoR groups based on three years and analyzed VOT in shorter LoR (less than 3 years of LoR) and longer LoR groups (longer than 3 years of LoR). However, this study did not divide the two groups but treated LoR as a continuous variable. Thus, in this data, the effect of LoR might be more maximized than in previous studies.

Along with LoR, the next important predictor on more SK-like VOT production was Identification score, among Identification, Assimilation, and Language attitude

scores. There was a tendency that the more the NK speakers considered themselves SK members, the more they produced SK-like VOT in stops, which supports previous studies (Foreman, 2003; Stanford, 2007; Siegel, 2010; Nycz, 2019).

With regard to F0, Language attitude was the most important predictor. It is noteworthy that Language attitude outperformed LoR. The second most important factor was LoR to produce SK-like F0 patterns. Thus, the NK speakers with more positive language attitude toward SK and longer LoR could distinguish F0 of lenis from aspirated stops, to a larger extent, like the SK speakers.

Previously, relations between positive attitude towards nonstandard D1 and frequency of producing D1 variants in D2 region have little been examined so far to my knowledge. Ladegaard (2000) might be one relevant study to this chapter. In his study, when a speaker identified positively with his or her regional dialect, the speaker used more regional varieties in his or her speech. However, the nonstandard speakers in Ladegaard (2000) were not 'geographically mobile speakers' (Nycz, 2018) and in the process of acquiring second dialect. In other words, when nonstandard speakers move to a new dialect region, the relationships between their attitudes towards their original dialect and second dialect acquisition were not known. Thus, this chapter can shed a light on effects of Language attitude on acquisition of second dialect features, contributing to the second dialect acquisition and sociolinguistic field. The results of F0 illustrated that nonstandard D1 (NK) speakers with positive attitudes toward NK were reluctant to acquire the second dialect (SK) and therefore, they did not acquire the new dialect feature (F0) than those with negative attitude toward NK. More importantly, these positive

attitudes toward NK could be the most significant predictor that restrains the NK speakers from acquiring SK.

A complex relationship between the factors and SK-like stop production was found. It is noteworthy that different factors affected VOT and F0. More specifically, to produce more SK-like VOT patterns, LoR and Identification were important predictors. In other words, the NK speakers with longer LoR and strong SK identity can produce more SK-like VOT patterns. Given that the NK speakers' D1 (NK) and D2 (SK) can have different social meanings in terms of gender, positive attitudes toward SK variety can appear to be an important factor to raise F0 of aspirated stops like SK speakers. In terms of VOT, Identification was the second most important factor. Note that VOT is a more subtle cue than F0 in SK (Jang, 2017, see also Chapter I). Thus, to notice the subtle cue and produce lenis and aspirated stops with the subtle difference, the NK speakers might need to identify themselves as South Korean and have strong SK identity. However, to produce more SK-like F0 patterns, Language attitude and LoR were critical predictors. The NK speakers with positive language attitude toward SK variety could produce SK-like F0 patterns, raising F0 of aspirated stops. Previous studies have reported that higher F0 have social meanings of femininity and softness in general (Ohara, 1999; Winter & Grawunder, 2014; Idemaru et al., 2018). In addition, standard varieties can be often evaluated more 'Feminine', 'Gayish', 'Urban', 'Girlish', 'Socially upward orientated', and 'Soft' than nonstandard varieties (Pharao et al., 2014; Ladegaard, 2010; Preston, 2002, see also Chapter I). In contrast, it has been reported that nonstandard varieties can be often judged as more 'masculine', 'immigrant', 'tough', and 'working class oriented' (Pharao et al., 2014, and see also Chapter I). Thus, SK variety might also have social

meanings of ‘femininity’ and ‘softness’ whereas NK variety may have social meanings of ‘masculinity’.

SK-like stop production is related to LoR, degree of Identification and Language attitude towards SK. It can be noteworthy that Assimilation score did not influence SK-like VOT and F0 production. As noted in the F0 dissimilators’ responses, positive assimilation in South Korea did not directly affect SK-like F0 acquisition. In other words, the NK speakers who are adapted well in SK may still be unwilling to acquire SK stop patterns. To acquire and produce SK stop patterns, along with longer LoR, to what extent they consider themselves as South Korean and have positive language attitudes towards SK can be more important than Assimilation. This might be related to their unstable ‘refugee’ status in South Korea. They chose to escape from North Korea and to settle down in South Korea to find a better life (Kim & Jang, 2007 and see also Chapter I). Thus, as they responded, they preferred to live in South Korea to live in North Korea because of freedom, capitalistic ideology, and better infrastructure and environment in South Korea. This better and more satisfying environment might lead them to easily assimilate in South Korean society better in general. However, enjoying and appreciating a free life with material convenience (which would lead to high assimilation scores) might not lead NK speakers to necessarily acquire SK-like stops.

To address the third research question, individual responses were examined. Four speakers (Speakers #1, 3, 7, and 18) were identified as VOT/F0 assimilators. All these speakers, except for one (speaker #18), had relatively longer LoR (7.6 years on average) and younger AoA (15.6 years on average). Speaker #18 was unusual in that she still could assimilate SK-like VOT and F0 patterns even though she arrived in Seoul at the age of 19

years old and stayed in Seoul for only one year. In contrast, six speakers (#4, 5, 16, 19, 20, and 22) were identified as VOT/F0 dissimilators. Except speaker #20, the dissimilators' AoA was relatively older (19.8 years on average) and LoR was shorter (1.8 years on average). Speaker #20 did not acquire and produce SK-like VOT and F0 patterns although he has lived in Seoul for ten years.

It was notable that some participants only assimilated one of the cues. While speakers #17 and 18 only assimilated F0 patterns of SK stops, Speakers #6 and 21 only dissimilated F0 of SK stops. Because the individuals might notice a cue differently and each cue has different social meaning, some participants might more actively acquire and produce one cue and others may exclusively dissimilate the only one cue between VOT and F0. For instance, because higher F0 of aspirated stops may have a social meaning of femininity and speakers #6 and 21 may notice the social meaning of F0, they might dissimilate the F0 cue in stop production.

Unlike the VOT assimilators (AoA: 16.6 Y, LoR: 5.6), mean of AoA and LoR in F0 assimilators was relatively older and shorter in general (AoA: 19.6 Y, LoR:4.4), $t(4450.6) = -22.9$, $p < 0.001$. This means that the NK speakers with older AoA and shorter LoR could acquire more SK-F0 pattern than VOT pattern of stops. Jang (2017) reported that VOT difference between lenis and aspirated was too subtle to notice (see also Chapter I). It may be that F0 is more robust and noticeable for the NK speakers. In future research, it will be useful to investigate how SK and NK listeners judge stops of the VOT and F0 dissimilators I predict that younger SK listeners (whose stop cue is F0) may not notice the VOT distinction between lenis and aspirated stops in NKs' production. Thus, they might not judge the VOT of the dissimilators as accented. In

contrast, when they listen to stops of the F0 dissimilators, they might judge them as more accented. In this case, it can explain why the NK speakers acquire SK-like F0 of stops relatively earlier than SK-like VOT. Moreover, it may explain why the NK speakers still differentiate VOT of lenis from aspirated stops, if they are not receiving error feedback from SK speakers.

Although F0 distinction may be more easily noticed, all six male NK speakers did not acquire SK-like F0 production even after arriving in Seoul at a relatively younger age (16Y) and living in Seoul for 3.5 years on average. Again, four of six male NK speakers were categorized as extraordinary F0 dissimilators. This study did not aim to examine gender effects on D2 acquisition and only included six NK male speakers. However, the analysis of individual patterns related to F0 raised a possibility of gender effects on D2 acquisition. In both the sociolinguistic interview and language attitude survey, all the male NK participants commented that they did not want to acquire SK dialect because it sounded feminine, childish, too cute and too soft. Although the majority of male NK speakers reported that they were satisfied living in SK, they still preferred NK dialect. First, Participants 5 and 19 reported that they have not experienced any discrimination because of their NK accent. Specifically, they commented that SK people were more willing to help them when they spoke NK dialect in the interview. Thus, they answered that they were proud of using NK dialect. In addition, Participant 20 responded that he disliked it when SK people considered him as NK person or *Cosencok* because of his NK accent. However, he still had more positive attitudes towards NK dialect. He also responded that NK dialect sounded stronger, more masculine, and cooler than SK dialect. Thus, the positive attitude towards NK might be related to gender identity. Chapter I

introduced that there is a tendency that nonstandard dialects are judged as more masculine, working-class, and less intelligence in general (King et al., 2021; Levon, 2014; Preston, 2002). Thus, standard D1 male speakers tend to acquire nonstandard D2 variants faster and better than standard D1 female speakers (Rys, 2007, see also Chapter I). Although NK dialect is perceived more negatively in SK society, the male NK speakers may think masculinity is more important than socially constructed negative attitudes towards NK dialect. Higher pitch is related to being physically small, cute, and feminine (Van Bezooigen, 1995; Ohara, 1999). Due to the strong masculine identity, male NK speakers might resist raising pitch in producing aspirated stops using relatively 'feminine' acoustic feature of F0 in SK stops. Future research can examine the relationship among masculinity, language attitude, and D2 acquisition.

Chapter IV. Topic-based style shift of NK speakers

4.1. Introduction

Based on two previous studies (Walker, 2014; Nycz, 2018), this chapter investigates how the NK speakers shift their stop production in different regional topics (conversational topics related to D1 region, North Korea, and D2 region, South Korea), especially with respect to their stance towards the topics. Studies by Nycz (2018) and Walker (2014) have been summarized in Chapter I and Chapter III, respectively; however, here, the two studies are summarized in more detail with focus on topic-based style shift.

First, Walker (2014) examined relations among attitudes, experiences, willingness to blend in accents, and topic shifting. She recruited in total ninety-seven participants from six different categories: i) American expatriates living in the UK, ii) British expatriates living in the U.S., iii) American fans of England premier football team, iv) British fans of American football team, v) regular Americans for control, and vi) regular British for control. To examine relationship between attitude scores and topic shifting, she assessed attitudes of the participants, by calculating their scores of integration, experience, football fandom scores, attitude, and accent (Walker, 2014, p. 31-50, see also Chapter III). The participants read words about football teams and politicians' names in America as well as football teams and politicians' names in England, and neutral words, including /t/, /r/, and BATH vowels. Thus, words that were related to America were categorized into the U.S. topics and words that originated from the U.K were labelled under U.K topics. To assess how the speakers shift their production depending on two

different regional topics (the U.S. and U.K.), results were analyzed using mixed-effect linear regression. According to Walker (2014), topic-based shifting in /t/, /r/, and BATH vowels was small and inconsistent. In addition, she reported that topic-based style shift was not related to identity, attitude, or experience factors. These results might be due to the fact at least in part that the speech materials were not from natural and spontaneous speech. The participants in Walker (2014) read word lists that were related to the U.S. and U.K in a lab style setting. In addition, it was not that her participants had particularly positive or negative stances towards the word lists. For example, even if they had positive attitudes towards the U.S., they may not have any peculiar stances towards the word such as 'George Bush' and 'Washington DC,' two of the words used in the study, by themselves (Walker, 2014, p. 175). In other words, perhaps they had no specific stances towards the test words, they might not shift their production in reading different topic words.

Moreover, the findings in Walker (2014) were contradictory from results in her previous study, Love and Walker (2013). Specifically, in Love and Walker (2013), D1 American English speakers with more British experience tended to shift their production in U.K. topics more than those with less experience. However, in Walker (2014), the interaction between experience and topic shifting was not found in her main model. Based on the results in her current study (Walker, 2014) and findings from her previous study (Love & Walker, 2013), she interpreted the results inductively. The results showed that D1 American English speakers with more British experiences did not shift their production, while the American non-expatriates with less British experience produced more BATH and British /t/ in overall UK topics (Walker 2014). Walker raised a

possibility that the speakers with less experience may have a more prejudicial notion about British production, and as a result, they may have exaggerated their production in U.K. topics. In contrast, the speakers with more British experiences may acknowledge British manner of pronunciation, but not shifting their production to a larger extent. Walker (2014) argued that when speakers already know how words are produced in the D2 region and have acquired the manner of pronouncing D2 varieties in reality, they may shift their production less when reading different regional topics. However, because the results regarding relations between topic-based shifting and experiences were contradictory in the two studies (Love & Walker, 2013; Walker, 2014), it is unclear how D2 learners shift their production in different topics. More importantly, because Walker (2014) did not show statistically significant relationship between experiences in D2 and topic shifting, it is still unknown whether or not the speakers with robust D2 acquisition show more topic shifting.

To study how speakers shift their production when they show either positive or negative stances towards D1 and D2 region, Nycz (2018) recruited seven D1 Canadian English speakers who moved to New York City and lived there for at least ten years. She interviewed the participants and asked them about their experiences, adaptation, and impressions in Canada and New York. She focused on how they shifted (oh), (o), (aw), and (ay) vowels to show different stances towards D1 (Canada) and D2 (New York) topics. She coded the participants' stances into six categories: i) aligned, ii) nonaligned, iii) positive, iv) negative, v) ambivalent, and vi) neutral. More specifically, solidarity expression towards the nation or locality were categorized as 'aligned'. Expressing distance and feelings towards belonging or a community were categorized as nonaligned.

Positive or negative evaluation towards the place was in either positive or negative stances, respectively. Expressions including both positive and negative stances were included in ambivalent. No explicit stances and expressions were included in neutral (Nycz, 2018, p. 179). More details and examples of coding in Nycz (2018) will be discussed in section 4.2.3.

Nycz's (2018) results showed that the Canadian English speakers living in New York produced higher (oh) (a linguistic marker in New York) more when they express positive stances toward New York. In contrast, when they expressed negative stances toward New York, they produced lower (oh) which is a typical Canadian stylistic pronunciation. According to Nycz (2018), the participants shifted their production to perform a different 'place identity'. For example, when they talked about New York City with a negative stance, they kept their distance from producing variants that are used by someone from New York City. Thus, they produced lower (aw) and (oh) to not perform 'New York identity'. In contrast, when they spoke about New York with a positive stance, they produced higher (aw) and (oh) to perform 'New York identity' more actively. Therefore, when her participants performed New York identity, by talking about New York positively, they produced more D2 varieties (Nycz, 2018).

Nycz (2018) provided critical results on topic-based style shift of D1 Canadian English speakers in conversational speech condition. Unlike Nycz (2018), in the current study, the NK speakers escaped from North Korea to seek better lives in South Korea, and they cannot legally visit their home again. Because of the 'refugee' status of NK speakers and the policy of repatriation to North in North Korea, even if they are not satisfied with living in South Korea, they do not have the option of being relocated to

North Korea or leaving South Korea (Lee, 2002; Park & Ahn, 2009, see also Chapter I). In addition, North Korean speakers often hide their origin and North Korean identity, not to be discriminated against in South Korean society (see Chapter I). Thus, related to their status in D2 region, the NK speakers may show different patterns to perform 'place identity' and present interesting patterns in terms of topic shifting. More importantly, it might be useful to examine how the NK speakers shift the two cues, VOT and F0, of stops.

Based on the two studies, this chapter aims to find relationships among stances, topics, and stylistic variation. This chapter focuses on intraspeaker variation in conversational speech condition. Two research questions are proposed.

(1) How do NK and SK topics influence VOT and F0 of stop production?

Walker (2014) reported that effects of topics were small in her statistical model. Related to the findings, I hypothesize that topic itself may not influence the NK speakers' VOT and F0 shifting. Thus, they may not shift their production depending on regional topics (D1, North Korea, and D2, South Korea).

(2) How do topic and stance influence VOT and F0 of stop production?

Note that the NK speakers significantly distinguished lenis and aspirated on the basis of both VOT and F0 in conversational speech as shown in Chapter II. Unlike the SK speakers, they significantly differentiated VOT of lenis and aspirated stops, suggesting that they have not acquired SK-like VOT patterns. However, they did differentiate F0 of lenis and aspirated stops, showing SK-like pattern, although the degree of F0 distinction was less than that of the SK speakers (see also Chapter II).

Considering that Nycz (2018) found topics and stances to influence geographically mobile speakers' style shift, I hypothesize that NK speakers would produce more SK-like stops when speaking about South Korea with a positive stance. Likewise, when they speak about North Korea negatively, they might also produce more SK-like stops (nondistinctive VOT but more distinctive F0 between lenis and aspirated stops). In contrast, they might produce more NK stop patterns (more distinctive VOT but less distinctive F0 between lenis and aspirated stops) when they talk about North Korea positively. Recall that Walker (2014) argued that fully acquired features in production may not be affected by topic and stance. If we follow her argument, NK speakers' F0 patterns might not change depending on topic and stance because they showed some acquisition of SK F0 pattern in stops. However, we should be cautious since Walker reported contradictory results (Love & Walker 2013, Walker 2014).

4.2. Methodology

4.2.1. Speakers, materials, and recording procedure

Same tokens of stops from speakers, speech materials, and recording procedure in Chapter II were used (see **Table 2.2.1.** in Chapter II). However, the careful speech condition in Chapter II was excluded to focus on intraspeaker variation in conversational speech condition. For the conversational speech, each of the NK speakers were individually communicating with the SK interviewer in sociolinguistic interview for approximately 45 minutes. The interview questions and topics are presented in Chapter II in more detail.

4.2.2. Tokens and measurement

VOT and F0 of same tokens from the conversational speech data included in Chapter II were analyzed, using same measurement in Chapter II. However, like in Chapter III, fortis stops were excluded to focus on acoustic cues of lenis and aspirated stops (see **Table 2.2.3.2.** in Chapter II). Like in previous chapters, F0 was centered to avoid gender effects on F0 (see also Chapter II). Tokens by topics and stance are presented in **Table 4.1.**

Table 4.1. Tokens by topics and stance

Stops	**Conversational speech**						**Total**
	North Korean topics			South Korean topics			
	Negative	Neutral	Positive	Negative	Neutral	Positive	
[k]	350	569	244	195	341	312	2011
[k^h]	17	27	16	10	38	35	143
[t]	257	363	178	146	217	242	1403
[t^h]	54	78	18	26	37	35	248
[p]	175	272	94	105	128	148	922
[p^h]	64	80	43	20	55	53	315
Grand total	917	1389	593	482	816	825	5042

4.2.3. Coding Topic and Stance in sociolinguistic interview

Using Walker (2014) as a model, topics were broadly coded by region NK and SK. SK topics included life in South Korea, South Korean neighbors, culture shock in South Korea, relationship with South Korean people, South Korean culture, career and education in South Korea, trips in South Korea, and language attitudes towards SK language. NK topics consisted of life in North Korea, childhood in North Korea, North Korean education, North Korean neighbors and community, immigration process (how and why they decided to escape North Korea), relationship with North Korean group, and language attitudes towards NK language (see also Chapter. II). For topic coding, topics were coded by responses. If a question was about SK topics, speakers' responses were coded as SK topics. In the responses, they did not compare NK to SK, but only answered about SK topics. In other words, they did not mention anything related to NK, rather they only answered about SK topics. It was the case for questions about NK topics as well.

Coding Stance was based on methodology that was proposed by Nycz (2018). Nycz (2018) coded her participants' stances into six categories. Examples of her coding are presented below (Nycz, 2018, p. 179).

(1) Aligned: solidarity expression towards the nation or locality

"Back in Canada I had all these friends and stuff (Jenny, re: Canada)"

"I fit in so nicely here (Sophie, re: NYC)"

(2) Nonaligned: distance and feelings towards belonging or community

"Here nobody knew me (Jenny, re: NYC)"

"Nobody did anything with their lives; I just didn't fit in there (Sophie, re: Montreal)"

(3) Positive: positive evaluation towards places

"Forest Hill was a wonderful mélange of people (Vanessa, re: Toronto)"

"I was back in Canada a few times and loved it (Jenny, re: Canada)"

(4) Negative: negative evaluation towards places

"It all goes back to no one likes Americans, they're going to shoot me if I do something wrong (Laurie, re: the United States)"

"The worst place to be in April is Toronto (Bob, re: Toronto)"

(5) Ambivalent: both positive and negative stances towards places

"New York is more spread out than other cities, so while there's great stuff it can be hard to find (Edward, re: NYC)"

(6) Neutral: no explicit stances

"My parents originally came from Poland (Sophie, no place topic) Nation."

Based on her categories, to focus more on how positive and negative stance towards D1 and D2 region influence topic shifting, I excluded categories of aligned, nonaligned, and ambivalent. I coded the NK speakers' stances into three categories: i) positive, ii) negative, and iii) neutral. Since topics included two regional topics, South

Korea, and North Korea, coding for topics and stances were categorized into six: i) neutral stance towards North Korean topics (NKNeu), ii) negative stance towards North Korean topics (NKN), iii) positive stance towards North Korean topics (NKP), iv) neutral stance towards South Korean topics (SKNeu), v) negative stance towards South Korean topics (SKN), and vi) positive stance towards South Korean topics (SKP). Stops in the categories were analyzed. Examples of coding from the current data are described below (all sentences were translated from Korean).

(1) Topic: North Korea, Stance: Neutral (**NKNeu)**

"My neighbors were farmers in general (Participant 2)"

"I finished military service in NK. At that time, I fixed traffic lanes. (Participant 6)"

(2) Topic: North Korea, Stance: Negative (**NKN**)

"I wanted to leave there… Literally, there was no freedom there. People in my hometown were rats. They watched my family and wanted to report every trivial behavior to the party (Participant 9)"

"I did not like it when people judged my outfits and hair style in North Korea. Why do they care so much about others? I did not like it and did not understand it. I should have been able to wear what I wanted and done any hair style that I wanted (Participant 15)".

(3) Topic: North Korea, Stance: Positive (**NKP**)

"I loved living there. It was peaceful, there was no competition. I just hung out with my neighbors and friends, without worrying about my future (Participant 4)".

"I miss my hometown in North Korea. My neighbors were very caring, and foods were a lot better than here (Participant 5)".

(4) Topic: South Korea, Stance: Neutral (**SKNeu**)

"I have graduated college in Seoul and majored in literature (Participant 3)"

"I usually play video games after class. I want to work in a car industry right after graduating high school in SK (Participant 18)"

(5) Topic: South Korea, Stance: Negative (**SKN**)

"I do not have any clue what SK people are thinking. They seem so friendly and nice outside, but I always feel like they hide something in their mind and blame my bad North Korean accent inside. SK people always make compliments about my academic performance, outfits, and appearance. However, I never trust them (Participant 7)".

"I cannot stand it when SK people do not say something directly. I do not understand why they have to pretend they care or like something even though they do not. I dislike the way of their talking and I cannot trust what they really mean because of their 'pretentious way' (Participant 14)".

(6) Topic: South Korea, Stance: Positive (**SKP**)

"I love cultures in South Korea, music, dramas, and foods. I also like 'freedom' here (Participant 1)"

"People in Seoul are so friendly, and they helped me adapt here (Participant 5)".

"South Korean people are so nice, and they are always willing to help others (Participant 13)".

"I love the individualism way of lifestyle in South Korea… People are very warm-hearted, and they try to help me (Participant 22)".

In NK Neutral (NKNeu), the NK speakers simply provide information regarding their previous occupation, lives, and experiences in North Korea, without stance. We considered that, among the six categories, NKNeu would be closest to their baseline production. In other words, stop production in NKNeu may be close to their own actual D1 pronunciation in North Korea. Thus, stops in NKNeu was considered as a baseline and reference level among the six levels (NKNeu, NKN, NKP, SKNeu, SKN, and SKP). The goals of this chapter was to investigate how the NK speakers shift their stop production depending on NK and SK topics (research question 1) and how the speakers shift their stop production from their baseline (NKNew) to five other topic-stance categories (e.g., NKN, NK Negative) (research question 2)

4.2.4. Analysis

All analyses presented in this study were performed using mixed effect linear regression (Baayen et al., 2008) as implemented in the lme4 package (Bates, Mächler,

Bolker, & Walker 2015) in the R environment (R Core Team, 2020). I first analyzed the effects of Topic alone (when it was not combined with Stance) to address my first research question and to compare the current results to those of Walker (2014). The first two models address the first research question, examining the effect of the factor Topic (NK vs. SK) on VOT and F0 of lenis and aspirated stops. As noted in section 4.2, now fortis category was not included. The model analyzing each acoustic cue (VOT and F0) included Stop (Lenis, Aspirated, categorical factor, sum coded, with Lenis as the reference) and interaction with Topic (categorical variable, NK, SK, with NK as the reference) as fixed effects. In these models, the coefficients for the sum-coded stop reflects the difference in F0 and VOT between lenis and aspirated, the focus of the inquiry in this chapter. The model examining VOT included articulation rate (continuous variable) as a predictor to control for its influence on VOT. In addition, an interaction between Manner and Topic was included as a random intercept.

Next set of models (see 3~4 below) addresses the second research question and examines the effect of Topic and Stance combined ("Topic x Stance") on VOT and F0 difference between lenis and aspirated stops. (Here, "x" in "Topic x Stance" refers to the pairings of Topic and Stance, instead of an interaction term between two independent factors, which is denoted with * in the model.) The model analyzing each acoustic cue (VOT and F0) included Manner of stops (Lenis, Aspirated, categorical factor, sum coded, with Lenis as the reference) and interaction with Topic x Stance (categorical variable, NKNeu, NKN, NKP, SKNeu, SKN, SKP, with NKNeu as the reference) as fixed effects. As presented above, the second research aim in this chapter is to examine to what extent the NK speakers may change their stop production from their baseline production

(NKNeu) to other Topic x Stance conditions. Given this research aim, instead of including separate level of factors as Topic (NK vs. SK) and Stance (Neutral, Negative, and Positive), one category with six levels (NKNeu, NKN, NKP, SKN, SKP) was used in the model.

Like the first set of models, an interaction between Stop and Topic x Stance was added as a random intercept in the model. All models included a random intercept for Word, as it was possible that dependent measures varied due to lexical context. A random intercept for Speaker was also added. All models included a random slope for Stop by Speaker because by-speaker variation in the dependent variable could be conditioned by stop type. All slopes in the random effects were also uncorrelated to aide convergence.

9) VOT ~ Stop*Topic + scale(Articulation rate)+ (1+ Stop:Topic|| Participants) + (1|Word)
10) F0 ~ Stop*Topic+(0+Stop:Topic||Participants) + (1|Word)
11) VOT ~ Stop*Topic x Stance + scale(Articulation rate) + (1+ Stop:Topic x Stance||Participants) + (1|Word)
12) F0 ~ Stop*Topic x Stance + (0+Stop:Topic x Stance ||Participants) + (1|Word)

4.3. Results

4.3.1.1. Effects of topics on VOT

Effects of topics (alone without combining them with stance) on VOT are illustrated in **Figure 4.3.1.1.** The figures in this chapter plot the difference in VOT and F0

across lenis and aspirated stops on the Y axis, as the magnitude of this difference is the critical feature that characterize SK pattern of stop production. For VOT, small magnitude of this value (i.e., similar values of VOT across lenis and aspirated) represents SK pattern. The SK mean obtained in Chapter II is plotted in the figure (the bar in the left) for comparison.

According to **Figure. 4.3.1.1**, the VOT difference between SK and NK topics (the middle bar and the right bar) do not appear very different, and it is substantially larger than that of the mean of SK speakers (the left bar). The prediction model confirmed the observation regarding the effect of topic. The Manner*Topic interaction is critical in the current analysis because we are interested in the influence of Topic on the difference in VOT across lenis and aspirated. The interaction term was not significant ($p = 0.916$) as shown in **Table 4.3.1.1.** These results confirm that SK topics did not influence NK speakers to produce more SK-like VOT patterns of stops. Specifically, the robust difference of VOT between lenis and aspirated stops did not vary across when the NK speakers were talking about NK topics or SK topics. Thus, the NK speakers maintained more NK-like VOT patterns even in SK topics. These results are consistent with the previous report that regional topic did not affect shifting between D1 and D2 varieties (Walker, 2014).

Figure 4.3.1.1. Topic Effects on VOT of NK speakers

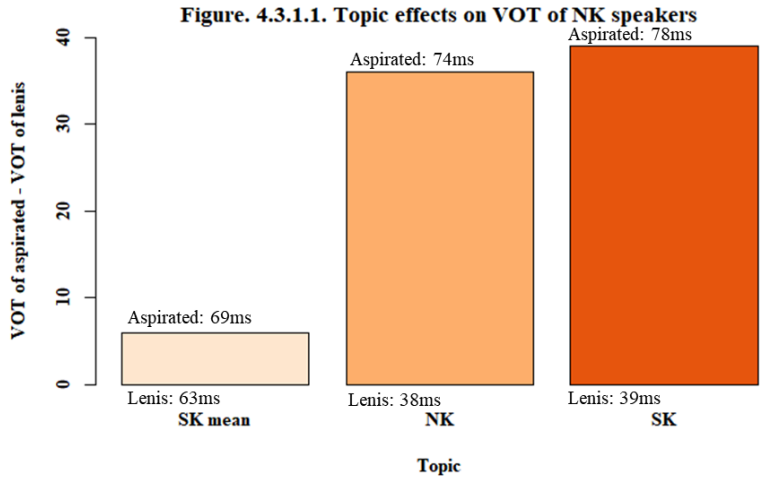


Table. 4.3.1.1. The Output of Model (1) for Topic effects

		VOT		
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	38.54	37.59 – 39.49	79.70	**<0.001*** **
Aspirated	33.01	30.66 – 35.37	27.44	**<0.001*** **
SK topic	1.31	0.15 – 2.47	2.21	**0.027***
Articulation rate	-10.01	-10.58 – -9.44	-34.26	**<0.001*** **
Aspirated * SK topic	0.33	-5.73 – 6.38	0.11	0.916

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

4.3.1.2. Effects of topics on F0

Topic effects on F0 are illustrated in **Figure 4.3.1.2.** The difference in F0 across lenis and aspirated stops on the Y axis. For F0, large magnitude of this value (i.e., more distinguished values of F0 across lenis and aspirated) represents SK pattern. The SK mean obtained in Chapter II is plotted in the figure (the bar in the left) for comparison.

According to the figure, the F0 difference between SK and NK topics (the middle bar and the right bar) do not seem to be different. The results of model (2) confirmed the observation. Again, the interaction between Manner*Topic, the critical interaction for our research question, was not significant (p = 0.679) as shown in **Table 4.3.1.2.,** indicating that SK topics did not influence the NK speakers to produce more SK-like F0 patterns (more distinguished F0 between lenis and aspirated). The F0 between lenis and aspirated did not vary depending on the topics. Thus, the NK speakers maintained their own manner of F0 patterns even in SK topics. These results are consistent with the previous report that that regional topic did not affect shifting between D1 and D2 varieties (Walker, 2014).

Figure 4.3.1.2. Topic Effects on F0 of NK speakers

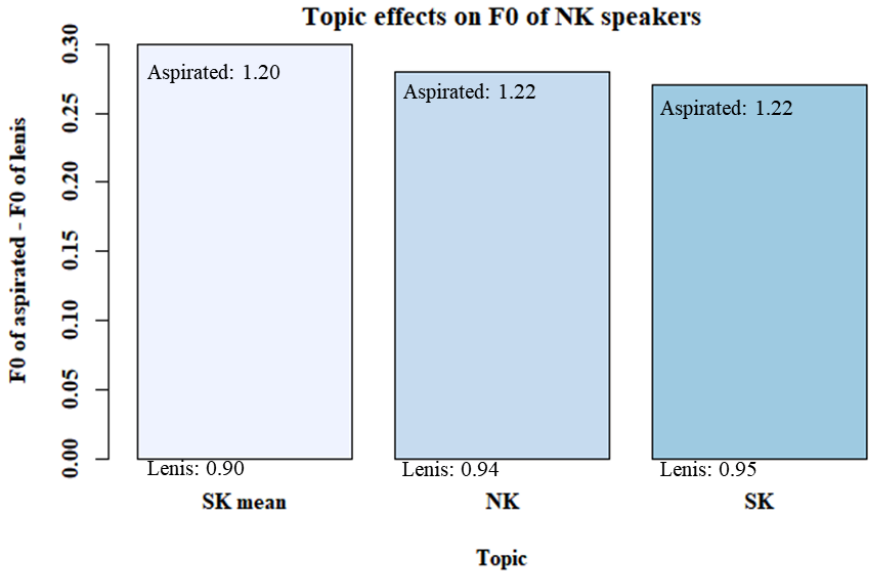


Table. 4.3.1.2. The Output of Model (2) for Topic effects

	F0			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	0.95	0.94 – 0.96	258.57	**<0.001*** **
Aspirated	0.28	0.23 – 0.33	11.02	**<0.001*** **
SK topic	0.00	-0.01 – 0.01	0.62	0.538
Aspirated * SK topic	-0.01	-0.04 – 0.03	-0.41	0.679

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

4.3.2.1. Effects of topics and stance on VOT

To address the second research question, the factor Topic x Stance were included in the model (see model 3). Topic x Stance effects on VOT are illustrated in **Figure 4.3.2.1.** Like the figures above, the **Figure 4.3.2.1** presents the difference in VOT across lenis and aspirated stops on the Y axis, the critical feature that shows SK pattern of stop production. Different from **Figure 4.3.1.1.**, the VOT difference did show some fluctuations depending on Topic x Stance in **Figure 4.3.2.1.** It is notable that the magnitude of VOT difference is the largest in NK neutral (NKNeu), the baseline, and the smallest (more SK like) in NK negative (NKN).

Model (3) confirmed the observations. The Manner*Topic x Stance interaction is critical in the current analysis as it was in the previous analyses. The interaction terms were significant in NKN, NKP, SKN, and SKP ($p < 0.001$, $p < 0.001$, $p < 0.001$, and $p = 0.028$, respectively) as shown in **Table 4.3.2.1.** These results confirm that Topic x Stance of NKN, NKP, SKN, and SKP did reliably influence the NK speakers to produce more

SK-like VOT patterns of stops compared to the baseline NKNeu. As noted above, the robust VOT effect was found in NKN with the estimate values (-17.47ms). This means that the NK speakers' VOT difference between lenis and aspirated stops was -17.47ms shorter than the VOT difference between lenis and aspirated stops in NKNeu (the baseline reference level). Thus, the NK speakers showed the most SK-like VOT patterns when they were talking about North Korea negatively, among all Topic and Stance combinations. Unlike results in Nycz (2018), however, the NK speakers did not produce the most SK-like VOT patterns when they talked about SK positively. In addition, they did not produce the most NK-like VOT patterns when they spoke about SK either negatively or NK positively.

Figure 4.3.2.1. Effects of Topic x Stance on VOT of NK speakers

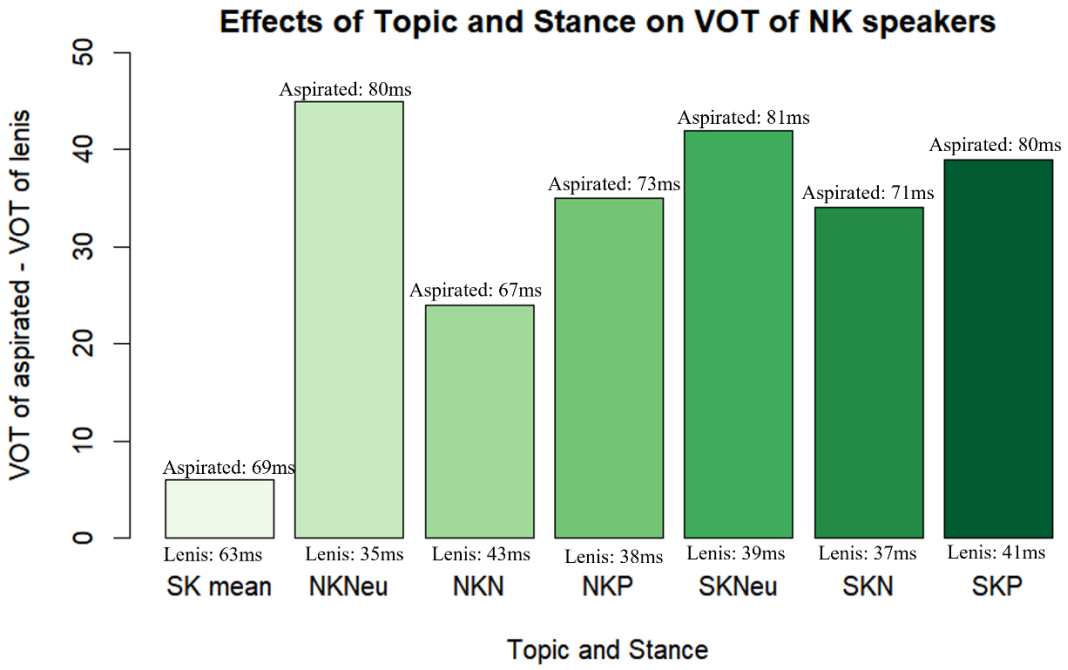


Table. 4.3.2.1. The Output of Model (3) for Topic and Stance effects

	VOT			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	35.37	34.16 – 36.58	57.09	**<0.001*** **
Aspirated	41.12	37.95 – 44.29	25.41	**<0.001*** **
NKN	7.83	6.14 – 9.53	9.05	**<0.001*** **
NKP	3.19	1.26 – 5.12	3.24	**0.001*** **
SKN	4.10	2.06 – 6.14	3.94	**<0.001*** **
SKNeu	2.92	1.16 – 4.69	3.24	**0.001*** **
SKP	6.12	4.36 – 7.88	6.80	**<0.001*** **
Articulation rate	-9.84	-10.41 – -9.27	-34.05	**<0.001*** **
Aspirated*NKN	**-17.47**	**-23.21 – -11.73**	**-5.96**	**<0.001*** **
Aspirated*NKP	-7.90	-14.57 – -1.23	-2.32	**0.020***
Aspirated*SKN	-14.36	-21.70 – -7.02	-3.83	**<0.001*** **
Aspirated*SKNeu	-3.71	-11.77 – 4.34	-0.90	0.366
Aspirated*SKP	-8.15	-15.45 – -0.86	-2.19	**0.028***

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

4.3.2.2. Effects of stance on VOT?

Note that the NKs' VOT difference between lenis and aspirated was significantly shorter (thus, more SK-like VOT pattern) in NKN, NKP, SKN, and SKP compared to the baseline NKNeu. Also note that SKNeu (SK neutral topic) was not different from NKNeu. These results may mean that, regardless of regional topics (NK vs. SK), when the NK speakers were speaking with some emotional stance (Negative and Positive), their

VOT pattern shifted from the baseline (NKNeu). Perhaps when they speak with neutral stance, they maintain their baseline pattern of speech (thus baseline pattern of stop production) whether the topic is those of NK or SK. Although I had made a decision to set up six Topic x Stance levels combining the two factors, I also decided to examine possible effects of Stance alone here. The follow-up model (5) was run.

(5) VOT ~ Stop*Stance + scale(Articulation rate) + (1+ Stop:Stance||Participants) + (1|Word)

The results showed that the interaction terms were significant (Aspirated*Negative: beta = -15.10, CI -20.84 – -9.35, $p < 0.001$; Aspirated*Positive: beta = -6.42, CI -12.61 – -0.23, $p= 0.042$) indicating that Stance of Negative and Positive did influence the NK speakers to produce more SK-like VOT patterns of stops than Neutral Stance. Note that the negative sign of coefficients is consistent across the two interaction terms. Thus, regardless of whether it is positive or negative, the emotional stance of NK speakers affected their VOT significantly toward SK-like production. In the frameworks of Walker (2014) and Nycz (2018), these results would mean that the NK speakers performed their SK place identity when they were being more emotional, whether it is positive or negative. The reason why the speakers might do take up SK place identity across these emotions is considered in the Discussion section.

4.3.2.3. Effects of topics and stance on F0

Topic x Stance effects on F0 are illustrated in **Figure 4.3.2.2**. It is noteworthy that, numerically, the magnitude of F0 values is the smallest in NK neutral (NKNeu) and the largest in NK negative (NKN) (thus, most SK-like F0 production in NKN). More

interestingly, the magnitude of F0 value in NKN is numerically greater than that of F0 from the SK speakers in Chapter II. Although the focus of this chapter is not a general SK-NK comparison, it is remarkable to observe the more enhanced F0 effect in NKN than the mean of SKs' F0**.**

Figure 4.3.2.2 shows numerically interesting patterns of F0 changes in NKs' production. However, model (4) did not confirm the observations. Like other models above, the Manner*Topic x Stance interaction is critical in the current analysis. None of the interaction terms were significant ($p > 0.05$ for all, see **Table 4.3.2.2.**). These results indicate that the NK speakers did not shift their F0 pattern according to the Topic x Stance factor. These results are not consistent with those in Nycz (2018) and the results of VOT above.

Recall that the NK speakers' VOT was affected by Topic x Stance: While they showed more NK-like VOT production in NKNeu and SKNeu, they showed more SK-like VOT in other Topic and emotional Stance (i.e., NKN, NKP, SKN, and SKP). This result led me to consider that emotion (and resulting clear vs. non-clear speech) might be the determining factor for the VOT shift. However, these results were not found in the F0 production. First of all, the statistical tests did not show statistically significant F0 shifting in any of Topic and Stance. There were not consistent patterns in the numerical trends either. If this was the case of clear speech in neutral stance and non-clear speech in emotional stances, we would expect pronounced F0 in clear speech/neutral stance and reduced F0 in less-clear speech/emotional stances. On the contrary, we found that the numerical F0 difference was lowest in NKNeu and highest in NKN. It is noteworthy that the NK speakers performed VOT and F0 shifting differently. Unlike the Topic and Stance

significantly affected the NKs' VOT production, F0 was consistent across Topic x Stance categories. Possible explanations are discussed in the next section.

Figure 4.3.2.2. Effects of Topic x Stance on F0 of NK speakers

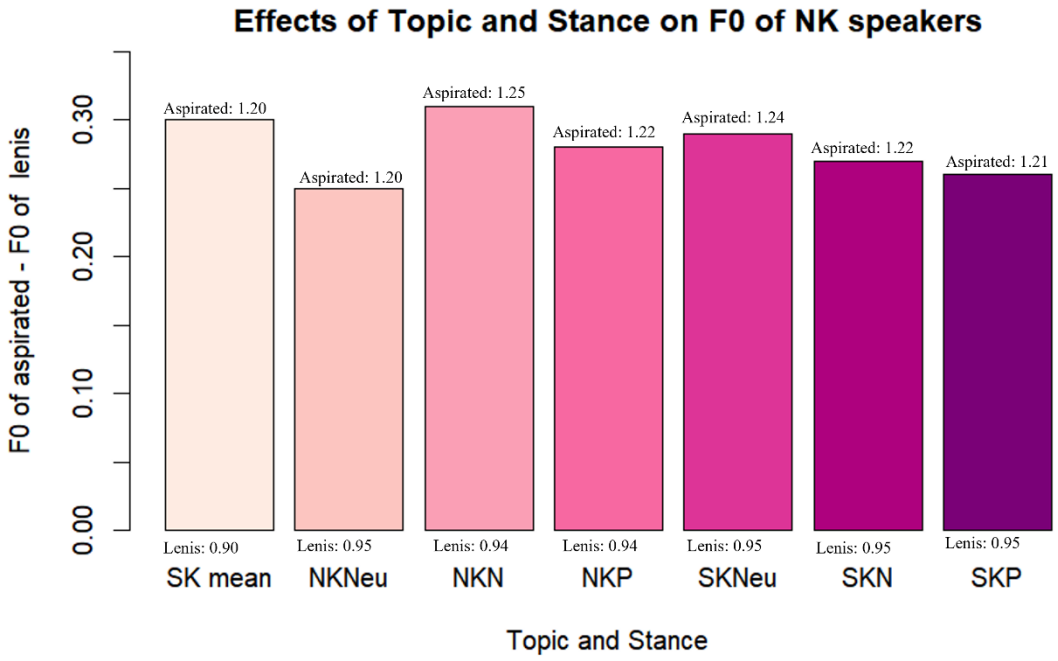


Table. 4.3.2.2. The Output of Model (4) for Topic and Stance effects

	F0			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	0.95	0.94 – 0.96	194.46	**<0.001*** **
Aspirated	0.28	0.26 – 0.31	22.01	**<0.001*** **
NKN	-0.00	-0.02 – 0.01	-0.57	0.571
NKP	-0.01	-0.02 – 0.01	-0.86	0.391
SKN	-0.00	-0.02 – 0.02	-0.01	0.994
SKNeu	-0.00	-0.02 – 0.01	-0.18	0.856
SKP	0.00	-0.01 – 0.02	0.59	0.556
Aspirated*NKN	0.03	-0.04 – 0.09	0.78	0.434
Aspirated*NKP	-0.00	-0.06 – 0.05	-0.13	0.895
Aspirated*SKN	-0.02	-0.10 – 0.05	-0.61	0.540
Aspirated*SKNeu	0.02	-0.04 – 0.09	0.68	0.494
Aspirated*SKP	-0.01	-0.07 – 0.04	-0.46	0.643

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

4.4. Discussion

This chapter addressed two research questions to investigate to what extent the NK speakers may change their VOT and F0 production depending on Topic and Stance.

(1) How do NK and SK topics influence VOT and F0 of stop production?

(2) How do topic and stance influence VOT and F0 of stop production?

To address the first research question, effects of regional topic (NK vs. SK) on VOT and F0 production were examined. Note that Walker (2014) reported the topic itself

did not affect her participants' production. Based on her findings, I also hypothesized that topic might not affect the NK speakers' VOT and F0 production. Like findings of Walker (2014), the results confirmed that regional topics did not influence the NK speakers' stop production. Thus, the effect of topics was small and did not significantly affect the NKs' stops.

In terms of the second research question, I coded Topic and Stance based on Nycz (2018) and modified her coding to fit it better in this data. To focus on how the NK speakers change the pattern of stop production depending on Topic and Stance, their baseline (NKNeu) was compared to other Topic and Stance combinations, NK negative (NKN), NK positive (NKP), SK neutral (SKNeu), SK positive (SKP) and SK negative (SKN). Recall that the D1 Canadian English speakers in Nycz (2018) produced more New York (D2) like vowel patterns when they talked about New York positively. Moreover, they produced more Canadian-like vowels when they talked about Canada positively. Based on her findings, I hypothesized that NK speakers might produce more SK-like VOT patterns when speaking about South Korea with a positive stance and produce the most NK-like pattern in NKP was predicted.

However, these hypotheses were not supported. Whereas the VOT difference was substantial (thus more NK-like) in the baseline NK neutral and SK neutral (NKNeu and SKNeu), it was reliably shorter (thus more SK-like) in all other categories of NK and SK topics combined with negative and positive stances. Thus, results seem to indicate that regardless of regional topic (NK vs. SK), emotional stance (neutral vs. emotional) might influence the NK speakers VOT pattern. This is different from Nycz (2018), who found

similar pattern across D1 positive and D2 negative contexts (and D2 positive and D1 negative contexts).

We did find the most SK-like VOT patterns when the NK speakers expressed negative stance towards NK. This part of the result is consistent with Nycz (2018). Perhaps when the NK speakers expressed negative stance toward NK, they might distance themselves from NK but express more closeness towards SK, performing D2 'place identity'. However, this reasoning does not work well to explain the result of SKN (SK negative), where the speakers also showed SK-like VOT patterns. It is not consistent with Nycz's (2018) idea that the NK speakers show SK (D2) place identity when they are being negative about SK (D2) and also when they are being positive about NK (D1).

Perhaps we should consider the setting in which the NK speakers were placed with more care and nuance. Remember that the NK speakers were engaged with the SK interviewer (myself) in a conversational speech condition of the data collection session, from which the current data was drawn. I had never met the speakers prior to the data collection session. It is possible that the characteristics of the SK interviewer and the setting affected the NK speakers' presentation of self and, consequently, their speech. For example, the NK speakers might feel uncomfortable to talk about SK negatively and about NK positively to the SK interviewer. Perhaps talking about the interviewer's country negatively would offend the interviewer. And perhaps they might fear that they would be reported if they talk positively about North Korea. In other words, because they were conversing with the unfamiliar SK interviewer, they might end up performing 'SK identity' when they speak about something potentially sensitive. The effects of interlocutor will be further examined in the next chapter, Chapter V.

In terms of F0, I showed that the NK speakers significantly distinguished F0 between lenis and aspirated stops in Chapter II. Because F0 can be a more noticeable cue in SK (Jang, 2017, see also Chapter I), they may have already acquired the SK F0 patterns. Based on the previous studies (Walker, 2014; Jang, 2017; Nycz, 2018), particularly modeling Nycz (2018), I hypothesized that the NK speakers might produce more SK-like F0 patterns when speaking about SK with a positive stance and produce the most NK-like F0 pattern in NKP. The hypothesis was rejected. Unlike results in VOT, the results of F0 shifting were not found. Specifically, while their VOTs became more SK-like in NKN, NKP, SKN, and SKP, their F0 was consistent across all Topic and Stance categories. In other words, they did not significantly shift their F0 even when they talked about SK positively and NK negatively. This differential effects between VOT and F0 are noteworthy and puzzling.

In Walker (2014), the D1 American English speakers with more British experiences showed less shifting than the speakers with less British experiences (see section 4.1). Walker (2014) explained these results arguing that the speakers who have already acquired D2 variants may present less style shifting by topic. Like the more experienced D2 learners in Walker (2014), could it be that NK speakers do not shift F0, because they have already acquired SK F0 patterns and the F0 acquisition is stable? The NK speakers significantly distinguished F0 between lenis and aspirated stops in reading phrases and conversational speech although the degree of F0 distinction was significantly different from that of SK speakers (Chapter II). The NK speakers might have noticed the salient F0 distinction in SK variety and acquired F0 patterns. Using Walker's (2014) argument, this is perhaps why the NK speakers did not shift F0 while shifting VOT

across topic and stance. However, style-shifting is well-documented amongst native speakers who have proficiently acquired phonetic variants (e.g., Grieser, 2019; Rickford & McNair-Knox, 1994). In addition, Love and Walker (2013) reported a contradictory finding that speakers with more D2 experience showed shifting to more D2 variants compared to speakers with less D2 experience. Thus, I believe that the argument that speakers with more D2 experience show less style-shifting because of a greater extent of and more stable acquisition needs further examination.

Another, and more plausible, possibility is that the NKs' F0 might not be shifted because of the SK interviewer. As noted earlier, the NK speakers conversed with the unfamiliar SK interviewer in the current experimental setting. To underscore the context, all NK speakers spoke to the SK interviewer using honorific polite speech style, called *contaysmal* (see Chapter II). This is the style socially appropriate in this case, because the speakers and the interviewer were unfamiliar with each other. The SK interviewer also reciprocated the use of the honorific *contaymal* for the same reason. Previous studies on phonetics of polite speech have reported that in polite speech, speakers' prosodic features including F0 fluctuate less (Idemaru et al., 2019; Hübscher et al., 2018; Hübscher et al., 2017). This tendency has been reported in multiple languages, and has been termed as "prosodic mitigation" in polite speech, a proposal that speakers present themselves with more monotonous (perhaps calmer) prosodic effects when they are being polite (Hübscher et al., 2017). Relevant to the current study, Idemaru et al (2019) showed that F0 of native Korean speakers, along with that of Japanese speakers, was significantly less fluctuated in honorific polite speech (*contaysmal)* than non-honorific speech. Because the NK speakers in the current study were all speaking in honorific polite style *contaysmal,*

prosodic mitigation effects of the style might have caused no reliable variation (thus no topic/stance based shifting) in F0. Politeness effect on VOT has not been reported. This might be a reason why NK speakers did not shift F0 but shifted VOT.

Although the NKs' F0 did not show statistically significant variation, we observed some noteworthy numerical patterns. Specifically, the NK speakers enhanced F0 distinction (like SK pattern) in NK negative (NKN) even more than SK speakers of Chapter II. While the NK speakers live in South Korea, they might subconsciously notice that SK speakers in general distinguish F0 to a larger extent. When they spoke about NK negatively to the SK interviewer, they may try to perform 'SK identity' and express closeness towards SK, by exaggerating F0 distinction (numerically) and producing more SK-like stops. We note that the most SK-like VOT pattern was also found in NK negative. It appears that complaining about NK had something to do with performing SK identity across VOT and F0.

This study is the first attempts to examine NK refugee speakers' topic shifting. The results in this chapter were different from the findings of Nycz (2018), suggesting that simple association between positive/negative stance and the use of D1/D2 varieties may not always hold. This might be the case particularly for vulnerable community members such as NK refugees who may fear how they are viewed by the D1 society and members. In addition, more importantly, VOT and F0 showed different patterns of topic-based shifting in the NKs' production. This led us to consider possible effects of interlocutor on the NKs' production for both VOT and F0. It is possible that because the NK speakers were speaking to an unfamiliar SK interviewer, they only showed D2 (SK) identity (in terms of VOT) being afraid to reveal D1 (NK) identity. The use of (honorific

polite *contaysmal* speech with the SK interviewer likely mitigated variation in F0. To examine effects of interlocutor, in the next chapter, the NKs' topic-based stop shifting will be investigated when they converse with familiar NK interviewer.

Chapter V. Interlocutor and Topic x Stance Effects on the NKs' Stop Production

5.1. Introduction

This chapter aims to investigate to what extent the NK speakers may shift their stop production when they speak more comfortably with an interlocutor from the same origin (NK). Three different factors on the NKs' stop production will be examined in this chapter: i) interlocutor effects (SK interviewer vs. NK interviewer), ii) Topic effects and iii) Topic x Stance effects on the NKs' stop production with a NK interviewer.

First, I aim to examine to what extent the NK speakers differently produce stops with a NK interlocutor, comparing it to their production with a SK interlocutor reported in earlier chapters. In Chapter II, when the NK speakers conversed with the SK interviewer, the findings illustrated that their stop production moved away from the NK patterns (thus, closer to the SK patterns in terms of both VOT and F0). They still significantly distinguished all the three-way stop contrasts on the basis of VOT in all speech contexts. Nonetheless, the VOT difference between lenis and aspirated stops became significantly shorter in conversational speech, showing more SK patterns. In addition, while they did not distinguish F0 between lenis and aspirated stops when reading nonce words, they significantly differentiated F0 between lenis and aspirated stops to a largest extent (as SK speakers do) in conversational speech. In other words, they generally showed patterns closer to SK speech in conversational speech with a SK interviewer than in careful speech. The results in Chapter II raised a possibility that their speech production in conversational speech might be influenced by the SK interviewer.

As presented in Chapter I, nonstandard speakers often shift their production between standard and nonstandard varieties depending on interlocutors (Bell, 1984; Rickford & McNair-Knox, 1994; Giles, 2016). More specifically, audience design (Bell, 1984) demonstrated that speakers' stylistic variation is a response to their audience (Bell, 1984, p. 145). Because of a situational change (e.g., familiar vs. unfamiliar interlocutor, casual vs. formal context), speakers shift their production to adapt better to the situation. In addition, Giles (1980) explained speakers' style shift using speech accommodation theory. Speech accommodation theory describes that speakers accommodate their speech style to their addressee in order to win approval and to ease communication (Giles & Powesland, 1975). Specifically, "convergence" is observed when a speaker shifts their production by assimilating acoustic cues that their interlocutor uses (e.g., speech rate, accent, content, and pausing) to speak more like the interlocutor. Finally, Rickford and McNair-Knox (1994) showed a more specific example that nonstandard speakers restrain themselves from using vernacular style with a standard speaker in the interview (see also Chapter I). Based on the previous studies, interlocutor effects may also be found in the NKs' stop production. When the NK speakers communicate with a familiar NK interlocutor more casually and comfortably, they might show different stop patterns from the production with the SK interviewer.

Next, to what extent the NK speakers shift stops based on topic and stance with a NK interviewer is investigated. Chapter IV found effects of topic and stance combined, while no effect of topic alone was observed. The NK speakers showed shifting of VOT toward the SK pattern when they were talking with either positive or negative stance regardless of the regional topics, i.e., SK or NK. These results made me think that the NK

speakers might have been performing SK identity to guard themselves while speaking emotionally and about potentially sensitive matters with a SK speaker they do not know well. Their F0, on the other hand, did not vary at all across the topic and stance combinations. I considered "prosodic mitigation" (Hübscher et al., 2017; Idemaru et al., 2019) due to speaking politely as a potential explanation. The results for both VOT and F0 in Chapter IV raised a possibility that the nationality of the interviewer, SK, and the lack of familiarity between the speakers might have affected the outcomes.

In order to gain more information about NK speakers' speech patterns, this current chapter aims to examine their speech as they converse with *a NK interlocutor*. This chapter, thus, focuses on intraspeaker variation in conversational speech with the two different interviewers' origin (i.e., SK vs. NK) and stop production in the six topic x stance combinations (i.e., SK, NK topics x neutral, positive, negative stances). Three research questions are proposed.

1) How does the different interviewer (SK vs. NK) influence the NK speakers' VOT and F0?

The audience design model and speech accommodation theory (Giles, 1980; Bell, 1984; Rickford & McNair-Knox, 1994) showed that speakers shift their style depending on their addressee. Recall that more enhanced VOT and F0 distinction between lenis and aspirated can also be important features of clear (and polite) speech in SK (Oh & Idemaru, 2018; Kang & Guion, 2008; see also Chapter I).

Based on the previous findings, one possible hypothesis is that the NK speakers may show more NK-like stop patterns with the NK interviewer, distinguishing VOT between lenis and aspirated stops to a greater degree but distinguishing F0 between lenis

and aspirated stops to a lesser degree, as indicated in Chapter II. Another hypothesis is that, with the NK interviewer, they might be less likely to distinguish both VOT and F0 between lenis and aspirated stops, showing more casual form of speech in SK (see Chapter I) because they converse with the familiar NK interlocutor (close friend of them) casually. In contrast, with the SK interviewer, NK speakers might produce clear speech style of stops, by enhancing distinction of both VOT and F0 between lenis and aspirated more in order to speak more clearly to the unfamiliar SK interviewer.

2) In the conversational speech with the NK interviewer, how do Topics (NK vs. SK) influence the NKs' stop production?

Walker (2014) presented that the effects of topic itself were small and inconsistent. In addition, Chapter IV showed that topic did not affect the NKs' stop production when speaking with the SK interviewer. Based on the previous study (Walker, 2014) and findings in Chapter IV, I hypothesize that topic may also not influence the NK speakers' speech with the NK interviewer.

3) In the conversational speech with the NK interviewer, how do the NK speakers shift their stop production depending on topic and stance?

Note that an interlocutor may play a critical factor in production (Rickford & McNair-Knox, 1994; see also Chapter I). Nonstandard speakers tend to produce more vernacular style speech with an interlocutor from the same region (Rickford & McNair-Knox, 1994). I hypothesize that the NK speakers will show different patterns of shifting depending on topic x stance due to the NK interviewer. Like the findings in Nycz (2018), the NK speakers may perform 'NK identity', by producing more NK-like stops, with the NK interviewer in a positive stance towards topics related to North Korea. For instance,

they may produce more distinguished VOT and less distinguished F0 (more NK-like stop pattern, thus indexing 'NK identity') when speaking positively about North Korea and when speaking negatively about South Korea. In contrast, they may produce more SK-like stop patterns in NK Negative and SK Positive. However, because they communicate with the NK interlocutor, they may perform less SK identity.

5.2. Methodology

5.2.1. The NK speakers and NK interviewers

Among the 22 NK speakers in Chapter II, six NK speakers (Speaker # 8, 9, 15, 21, 22, four females and two males) returned for a second session and provided speech samples in conversation with a NK interviewer. The participants were paid a small amount of money for their time after the sociolinguistic interview. The conversation between NK speakers was collected one to three years after the speech collection with the SK interviewer. The six NK participants' demographic information and changes in LoR are presented in **Table 5.2.1.1.**

As for the interviewer, three speakers (Speaker #5, #15, #21) among the NK speakers in Chapter II served as as NK interviewers. Note that it could have been better if one NK interviewer had conducted all the NK-NK interviews as a single SK interviewer conducted all NK-SK interviews. However, some of the six NK speakers had a personal conflict with some potential interviewers. And some did not know other potential interviewers. To make sure all the six NK speakers were familiar and felt comfortable with their interlocutor/interviewer, three NK interviewers had to conduct the

sociolinguistic interview. Moreover, I made sure that the NK interviewer and speaker had built a strong bond and felt comfortable with each other, to obtain more comfortable and casual speech style from the NK speakers. As a result, the interviewer #5 interviewed the speakers #8, #9, and #21. After his own interview, the speaker #21 served as an interviewer for the speaker #15 to avoid uncomfortable pairing. Finally, because both the interviewer #5 and #21 did not know speaker #18 and #22, the speaker #15 interviewed NK speaker #18 and #22. **Table 5.2.1.2.** illustrates the information of NK interviewers. The NK interviewers were also paid a small amount of money for training and conducting a sociolinguistic interview.

Recall that the relationship between the NK speakers and the SK interviewer was formal and unfamiliar. Thus, they spoke to each other using more formal and polite speech register (*contaysmal*) as noted in the previous chapters. Different from the relationship between the SK interviewer and NK interviewees, the relationship between NK interviewee and NK interviewer was close friends. As a result, they spoke more naturally and comfortably, using *panmal* (non-honorific, casual register, which will be more discussed in section 5.2.2).

Table 5.2.1.1. Information of six NK speakers

NK speakers	With the SK interviewer (2018~ 2020Y)			With the NK interviewer (2021Y)		
Information	AoA	LoR	Education background	AoA	LoR	Education background
#8 (female)	17	**2**	High school	17	**4**	College (Sophomore)
#9 (female)	14	**4**	High school	14	**6**	College (Freshman)
#15 (female)	18	**3**	High school	18	**4**	College (Freshman)
#18 (female)	19	**1**	High school	19	**2**	College (Freshman)
#21 (male)	10	**9**	High school	10	**10**	College (Freshman)
#22 (male)	19	**1**	High school	19	**2**	High school

Table 5.2.1.2. Information of the three NK interviewers

NK interviewers	Age	AoA	LoR	Education background
#5 (male)	26	21	5	College (Freshman)
#15 (female)	22	18	4	College (Freshman)
#21 (male)	20	10	10	College (Freshman)

5.2.2. Materials, recording procedure, and speech style

To allow close comparison between SK-NK conversation and NK-NK conversation, the same sociolinguistic interview material was used from Chapter II (See Chapter II and Appendix C). However, the length of NK-NK conversations was longer lasting over approximately 90 minutes compared to 45 minutes of the SK-NK

conversations. The speaker and the interviewer sat face to face, and the same recording device was used as described in Chapter II.

Before starting the sociolinguistic interview, I had trained the NK interviewers on how to use the recorder by using a manual for about an hour. Moreover, based on Tagliamonte (2006), to conduct the interview between the NK speakers more naturally and comfortably, I gave specific and clear instructions to the NK interviewers such as: i) how to make the speakers feel comfortable before the interview, ii) how to open conversation, iii) how to ask questions clearly but friendly, iv) how to move on to the next questions/topics, v) how to encourage the speaker in a conversation. Including training for recording manuals and interviews, total training took approximately two hours.

At the interviews, I left the interviewer and the speaker alone in a quiet room so that they could speak comfortably and freely. Recall that the relationship between the NK interviewer and NK speaker was that of close friends. In addition, again, the aim of this chapter was to examine how the NK speakers produced stops in more casual and comfortable speech context with the NK interviewer (familiar, close friend). In a formal speech setting, which would include an interview, both North and South Korean speakers may opt to using polite speech register (*contaysmal)* even with a close friend because of the setting. Because of the aim of the study, I had explained to the interviewer and the speaker that they should feel free to use the non-honorific intimate register (*panmal).* All pairs used *panmal* with each other and they felt comfortable and natural doing so.

The number of stop tokens produced by NK speakers in the sociolinguistic interview is shown in **Table 5.2.3.1.** VOT, F0, and articulation rate (for control purpose)

related to these tokens were measured, using the same method from Chapter II. Tokens by topic and stance are presented in **Table 5.2.3.2.** below. However, fortis stops were excluded from Topic and Stance analysis, to focus on acoustic cues of lenis and aspirated stops like the previous Chapters. Again, fortis stops were consistently produced with the shortest VOT and did not go through changes in SK in the previous chapters.

Table 5.2.3.1. Number of stop tokens produced by NK speakers

Stops	**Conversational condition**
[k]	1241
[k*]	128
[k^h]	100
[t]	652
[t*]	241
[t^h]	98
[p]	395
[p*]	56
[p^h]	166
Grand total	3077

Table 5.2.3.2. Number of tokens by Topic and Stance

Stops	**Conversational speech**						**Total**
	North Korean topics			South Korean topics			
	Negative	Neutral	Positive	Negative	Neutral	Positive	
[k]	138	298	114	95	219	177	1041
[k^h]	6	17	10	7	30	30	100
[t]	93	179	71	39	146	124	652
[t^h]	27	29	11	7	16	8	98
[p]	56	122	41	39	73	64	395
[p^h]	20	33	26	10	52	25	166
Grand total	340	678	273	197	536	428	2452

5.2.3. Coding Topic and Stance

Stops were coded by the Topic and Stance of the utterance that included them, following the method proposed by Nycz (2018). Methodologies to code topic and stance were identical to coding in Chapter IV. Examples of coding between NKs' conversations are presented below.

1) Topic: North Korea, Stance: Neutral (**NKNeu)**

   "I moved near the border to escape from North Korea and that town was very close to China (Participant 15)"

   "In my town, kindergarten teacher was a popular job (Participant 9)"

2) Topic: North Korea, Stance: Negative (**NKN**)

   "I don't like NK dialect. It sounds so outdated and old (Participant 21)"

   "I didn't like it there. Basically, it was too inconvenient to live. Power was out all the time and roads were so muddy every time. (Participant 18)"

   "NK dialect sounds so weird and gross. I feel like NK dialect forces people to do something (Participant 22)"

3) Topic: North Korea, Stance: Positive (**NKP**)

   "I was happy every day because I didn't have any concerns there (Participant 8)"

   "My life was better there in general. I should have lived there (Participant 9)"

4) Topic: South Korea, Stance: Neutral (**SKNeu**)

   "I chose nursing as my career here (Participant 15)"

   "Because of COVID, I am just attending online zoom classes. (Participant 21)"

5) Topic: South Korea, Stance: Negative (**SKN**)

   "SK people are so fake. I hate their fake and fabricated ways (Participant 9)"

   "SK people are like wearing a pretentious pretense. People are not like actual human beings (Participant 8)"

6) Topic: South Korea, Stance: Positive (**SKP**)

   "SK language sounds a lot better. It sounds so soft, polite, and calm. (Participant 22)"

"I can't express how much I feel thankful for all kinds of help from South Korean people. They helped me to study for free and to learn useful abilities like coding and computer skills too. I couldn't survive without South Korean people. (Participant 21)"

In NKNeu, like Chapter IV, the NK speakers simply delivered information regarding the conversational topics without stance. Like Chapter IV, among the six categories of NKNeu, NKN, NKP, SKNeu, SKN, and SKP, NKNeu may represent their original 'NK' pattern of production. Thus, as a reference level, stops in NKNeu were used in topic and stance analyses, which will be discussed more in the next section.

5.3. Analyses

5.3.1. Covarying factors that are not controlled for

This chapter is a follow-up study to examine possible influences of interlocutor. The data in this chapter was collected at a later time than the previous chapters: the sociolinguistic interview between NK speakers was conducted later than the original interview with the SK interviewer. In other words, the current chapter may have unavoidable drawbacks in terms of data collection timeline and collinearity between familiarity (relationship with the interviewer: unfamiliar vs. unfamiliar), speech form (*contaysmal* vs. *panmal*) and the interviewers' origin (SK vs. NK).

First, the spoken data of NK speakers with the SK and NK interviewer was collected in different year. While the NKs' data with the SK interviewer was collected between 2018 and 2020 (see Chapter II), the NKs' production with the NK interviewer

was recorded in 2021. Thus, LoR of all NK speakers in this chapter were 1-3 years longer than when they provided speech with the NK interviewer. Because of the collinearity between LoR and interlocutor, LoR could not be included as a factor and not be controlled in the analyses.

Familiarity with the interlocutor and the register used covaried with the nationality of the interlocutor, and these factors could not be tested independently. The SK interviewer was unfamiliar to the NK speakers (they only met once for the interview), resulting in both interviewer and interviewee using honorific polite speech (*contaysmal*, see Chapter II) in their conversation. The NK interviewers on the other hand were quite familiar with the NK speakers they interviewed, and thus both parties spoke to each other using non-honorific speech (*panmal*). Thus, the interviewer's origin (SK vs. NK) covaried with the relationship and the speech register used (i.e., SK interviewer – unfamiliar – honorific form, NK interviewer – familiar – non-honorific form). I acknowledge that I did not include a familiar SK interviewer or an unfamiliar NK interviewer to tease apart the effects of the origin and familiarity.

With these factors not controlled for, I focus on interviewer's origin (SK vs. NK) in the analyses of the current chapter. I acknowledge that longer LoR at the time of the NK-NK interviews and the familiarity with the NK interviewer may well have influenced the outcome. I further address these issues in the subsequent sections.

5.3.2. Analysis of interlocutor effects

To examine the effects of interlocutor on VOT and F0, all analyses below involved mixed effect linear regression (Baayen et al., 2008) as implemented in the lme4

package (Bates, Mächler, Bolker, & Walker 2015) in the R environment (R Core Team, 2020). The first set of models (see 1-2 below) were run separately for VOT and F0. The models analyzing each acoustic cue (VOT and F0) included interlocutors' origin (SK interviewer vs. NK interviewer, dummy coded with NK interviewer as the reference level), manner of stops (Lenis, Fortis, Aspirated, categorical factor, dummy coded, with Lenis as the reference) and origin x stop interaction as fixed effects. The models only included the data from six speakers' production with the NK interviewer.

Although the three different NK interviewers conducted the interview with the six NK speakers, the different NK interviewers cannot be included in the models. Specifically, because only one SK interviewer (author of study) interviewed the NK speakers, the three different interviewers cannot be included as a factor. The model examining VOT included articulation rate (continuous variable) as a predictor for control purposes. All two models included a random intercept for Word, to control lexical effects. A random slope and intercept for Speaker was also added. The two models included a random slope and intercept for Stop (Manner) by Speaker to manage by-speaker variation in the dependent variable. Stop and Speaker in the random effects were uncorrelated to aide convergence.

1) VOT ~ Manner*Interviewer's origin + scale (Articulation rate) + (1+Manner: Interviewer's origin) || Speaker) + (1|Word)
2) F0 ~ Manner*Interviewer's origin + (0 + Manner: Interviewer's origin) || Speaker) + (1|Word)

5.3.3. Analyses of Topic and Topic x Stance effects

To investigate how the NK speakers' stop production was affected by Topic and Stance when they conversed with the NK interviewer, the exact same models in Chapter IV were used to analyze the current data, the six speakers' production with the NK interviewer. Like the models above, all models were performed using mixed effect linear regression (Baayen et al., 2008). Following the models in Chapter IV, fortis stops were removed to focus on distinction between lenis and aspirated stops. The first set of models (see 3 ~ 4 below) were run to examine the effect of Topic on VOT and F0 differences between lenis and aspirated stops. The next set of models (see 5 ~ 6 below) were run to examine effect of Topic and Stance on VOT and F0 differences between lenis and aspirated stops.

3) VOT ~ Stop*Topic + scale(Articulation rate) + (1+ Stop: Topic|| Participants) + (1|Word)
4) F0 ~ Stop*Topic + (0+Stop: Topic||Participants) + (1|Word)
5) VOT ~ Stop*Topic x Stance + scale(Articulation rate) + (1+ Stop: Topic x Stance||Participants) + (1|Word)
6) F0 ~ Stop*Topic x Stance + (0+Stop: Topic x Stance ||Participants) + (1|Word)

5.4. Results

5.4.1. Overall interlocutor effects

5.4.1.1. VOT

The mean VOT values of stops with the SK interviewer and NK interviewer are illustrated in **Figure 5.4.1.1.** In addition, the mean VOT values of total 22 NK speakers' stops in Chapter II are presented. As presented in **Figure 5.4.1.1.,** the six NK speakers differentiated VOT between lenis and aspirated with numerically larger extent with the SK interviewer than with the NK interviewer.

The results of model (1) are presented in **Table 5.4.1.1**. Since I am interested in the differential effects of NK interviewer and SK interviewer, the results of Stop x Interviewer interactions are critical.

As shown in **Table 5.4.1.1**., interactions between Manner and Interviewer were significant ($p < 0.001$ for both). Because the main effect of interlocutor was significant, post-hoc test was implemented to compare VOT of each stop category across NK and SK interviews. The post-hoc tests (Tukey's HSD) revealed that VOT of lenis and fortis was significantly shorter with the SK interviewer than with the NK interviewer ($p < 0.001$, and $p = 0.0014$, respectively). In contrast, the VOT of aspirated stops did not differ depending on the interviewers ($p = 0.955$).

Raised VOT for lenis is a characteristic more of SK stops than of NK stops. The current results indicated that NK speakers showed this pattern of SK stops (raised VOT for lenis, thus smaller lenis-aspirated difference) when speaking with the *NK interviewer*

than with the SK interviewer. However, this may be related more to a more casual manner of speech used with the NK interviewer compared to a more formal manner of speech used with the SK interviewer.

Figure 5.4.1.1. VOT of Stops Depending on Interlocutors

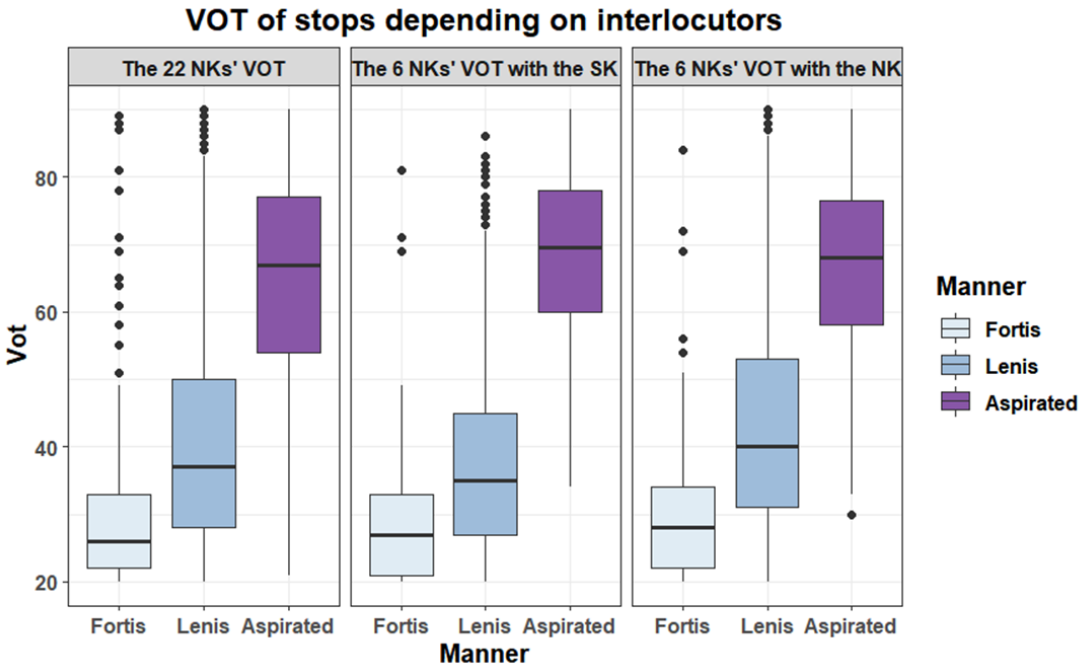


Figure 5.4.1.2. Predicted Values of VOT by Interlocutor

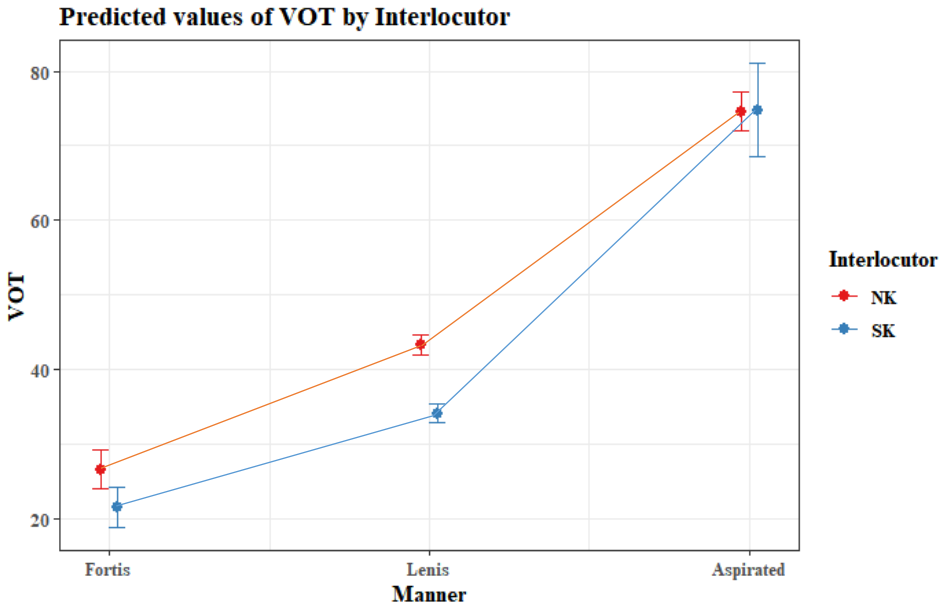


Table 5.4.1.1. The Output of Model (1) in NKs' speech: Lenis and NK interviewer are the reference category.

	VOT			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	43.31	42.05 – 44.57	67.39	**<0.001*** **
Fortis	-16.69	-19.62 – -13.75	-11.15	**<0.001*** **
Aspirated	31.25	28.35 – 34.15	21.11	**<0.001*** **
SK interviewer	-9.15	-10.55 – -7.74	-12.75	**<0.001*** **
Articulation rate	-8.62	-9.28 – -7.96	-25.67	**<0.001*** **
Fortis*SK interviewer	4.10	0.70 – 7.50	2.36	**0.018***
Aspirated*SK interviewer	9.35	2.57 – 16.13	2.70	**0.007****

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

5.4.1.2. F0

Figure 5.4.1.3. illustrates the mean F0 values of stops with the SK interviewer and NK interviewer, as well as the total 22 NK speakers' F0 in Chapter II. Like the figures of VOT, both **Figure 5.4.1.3.** and **Figure 5.4.1.4.** present that the NK speakers' F0 of lenis and aspirated was numerically less distinguished with the NK interviewer.

The results of model (2) are presented in **Table 5.4.1.2**. In the results of **Table 5.4.1.2**, marginally significant interaction between Manner and Interviewer was found (p =0.058). Post-hoc tests (Tukey's HSD) revealed that their F0 of lenis and fortis did not change depending on the interviewers (p = 0.17 and p =0.54, respectively). However, F0 of aspirated stops was significantly lower with the NK interviewer than with the SK interviewer (p = 0.012). Thus, with the NK interviewer, they distinguished F0 between lenis and aspirated stops to a lesser degree, showing a more NK pattern of F0. Again, this may also be related to a more casual manner of speech that is often associated with less robust differentiation between phonetic categories.

Figure 5.4.1.3. F0 of Stops Depending on Interlocutors

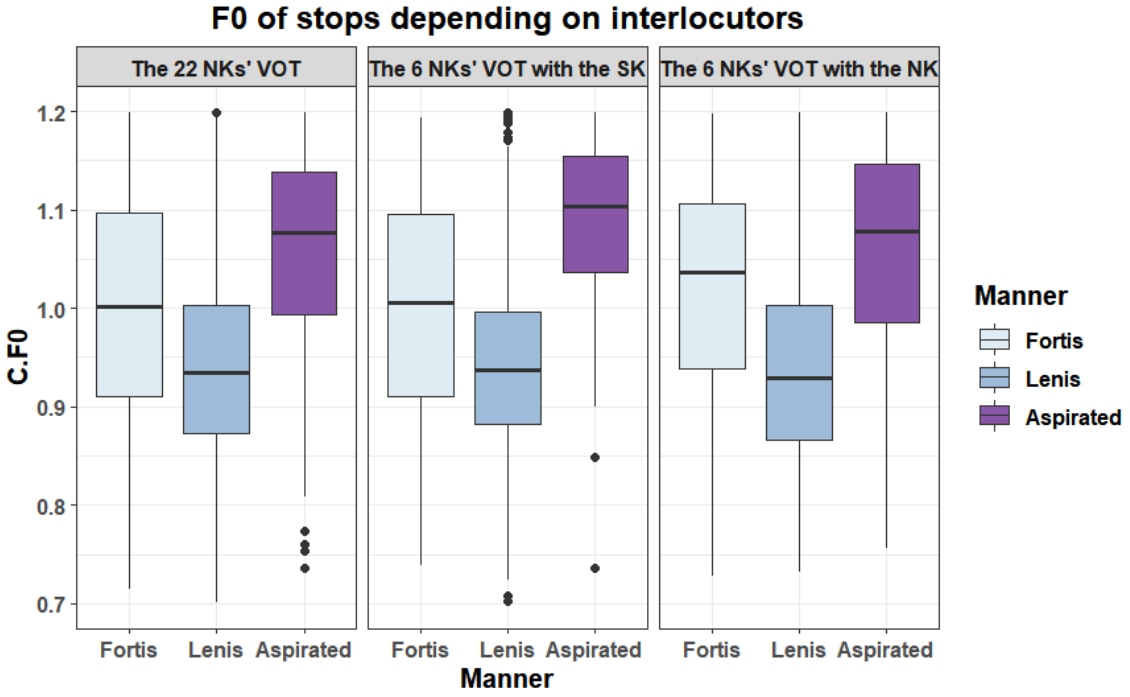


Figure 5.4.1.4. Predicted Values of F0 by Interlocutor

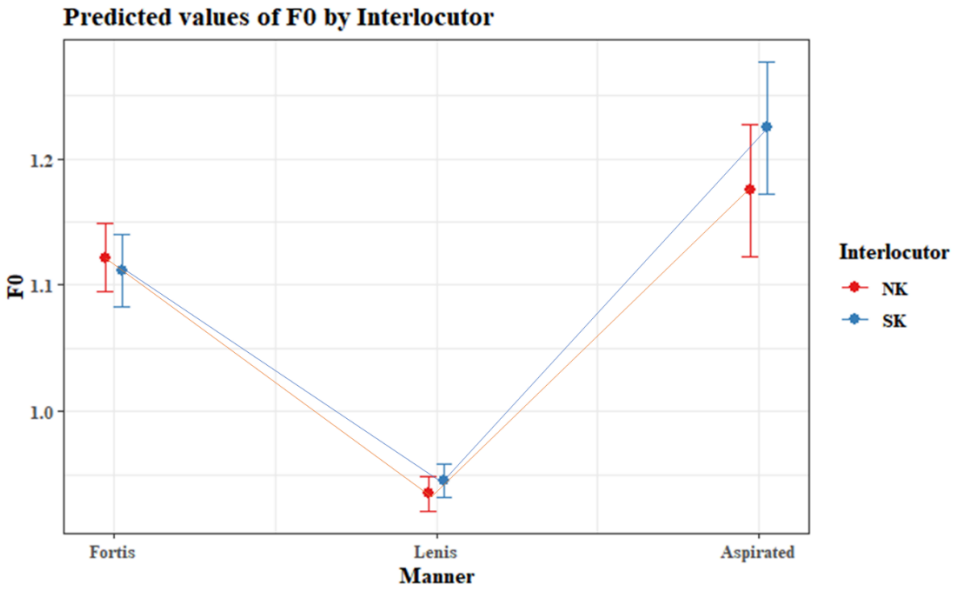


Table 5.4.1.2. The Output of Model (2) in NKs' speech: Lenis and NK interviewer are the reference category.

	F0			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	0.93	0.92 – 0.95	133.22	**<0.001*** **
Fortis	0.19	0.16 – 0.22	12.29	**<0.001*** **
Aspirated	0.24	0.19 – 0.29	8.83	**<0.001*** **
SK interviewer	0.01	-0.00 – 0.03	1.37	0.171
Fortis*SK interviewer	-0.02	-0.06 – 0.02	-1.13	0.259
Aspirated*SK interviewer	0.04	-0.00 – 0.08	1.89	**0.058.**

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

5.4.2. Effects of Topic between NKs conversation

5.4.2.1. VOT

Effects of topics (alone without combining them with stance) on VOT are illustrated in **Figure 5.4.2.1.** Like Chapter IV, the figures in this chapter illustrate the difference in VOT and F0 across lenis and aspirated stops on the Y axis, as the magnitude of this difference is the critical feature that characterize SK pattern of stop production. For VOT, the small magnitude of this value (i.e., similar values of VOT across lenis and aspirated) represents SK pattern. The SK mean obtained in Chapter II is plotted in the figure (the bar in the left) for comparison.

According to **Figure. 5.4.2.1**, the VOT difference between SK and NK topics (the middle bar and the right bar) do not seem very different, and it is larger than that of the mean of SK speakers (the left bar). The prediction model (3) confirmed the observation regarding the effect of topic. The Manner*Topic interaction was not significant ($p = 0.864$) as shown in **Table 5.4.2.1.** These results confirm that SK topics did not influence NK speakers to produce more SK-like VOT patterns of stops with the NK interviewer. These results are consistent with the previous report that that regional topic did not affect shifting between D1 and D2 varieties (Walker, 2014) and the findings in Chapter IV.

Figure 5.4.2.1. Topic Effects on VOT of NK speakers

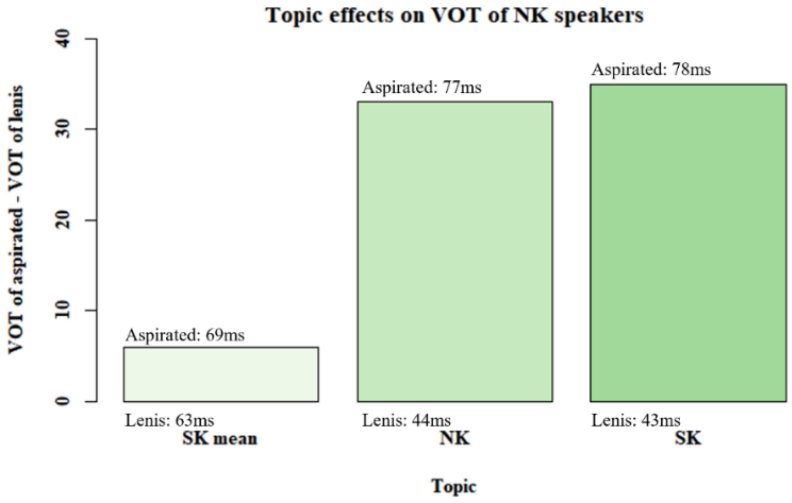


Table 5.4.2.1. The Output of Model (3) for Topic effects: Lenis is the reference category.

	VOT			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	44.12	42.20 – 46.04	45.06	**<0.001*** **
Aspirated	30.81	26.46 – 35.15	13.89	**<0.001*** **
SK topic	0.32	-1.95 – 2.58	0.27	0.785
Articulation rate	-11.38	-12.51 – -10.24	-19.66	**<0.001*** **
Aspirated*SK topic	0.72	-7.49 – 8.93	0.17	0.864

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

5.4.2.2. F0

Figure 5.4.2.2. presents the difference in F0 across lenis and aspirated stops for NK and SK topics from the current NK speakers and the mean value of F0 across lenis and aspirated stops from SK speakers in Chapter II. Large magnitude of this value (i.e., more distinguished values of F0 across lenis and aspirated) represents SK pattern, as indicated by the left bar in the figure.

According to the figure, the F0 in SK topics does seem to be less distinguished (the right bar). Model (4) was run to examine the effects of topic on the NKs' F0 production. The interaction between Manner*Topic, the critical interaction for our research question, was not significant (p = 0.089). as shown in **Table 5.4.2.2.,** indicating that SK topics did not affect the NK speakers to produce either more SK-like F0 (more distinguished F0 between lenis and aspirated) or more NK-like F0 patterns (less distinguished F0 between lenis and aspirated). These results are also consistent with the VOT results above as well as findings in Chapter IV and Walker (2014).

Figure 5.4.2.2. Topic Effects on F0 of NK speakers

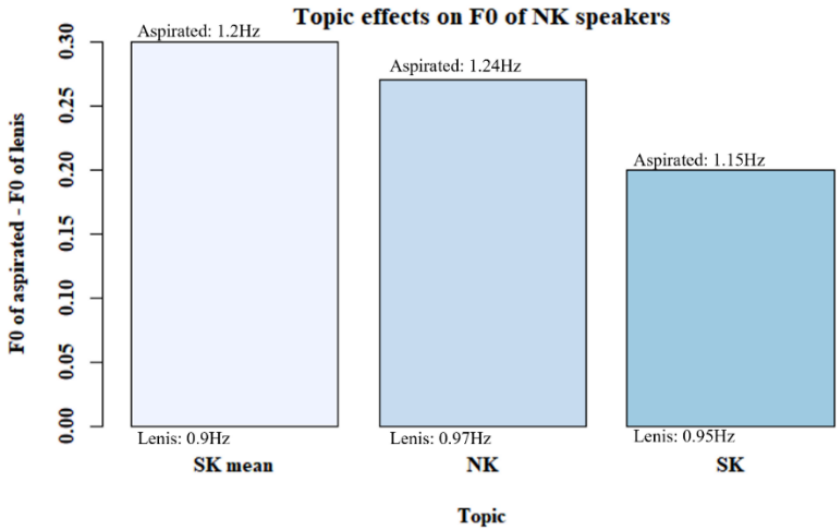


Table 5.4.2.2. The Output of Model (4) for Topic effects: Lenis is the reference category.

	F0			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	0.96	0.95 – 0.98	106.54	**<0.001*** **
Aspirated	0.26	0.22 – 0.31	12.53	**<0.001*** **
SK topic	-0.02	-0.04 – 0.00	-1.64	0.101
Aspirated*SK topic	-0.05	-0.11 – 0.01	-1.70	0.089

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

5.4.3. Effects of Topics and Stance on VOT and F0

5.4.3.1. VOT

To address the third research question, the factor topic x stance was included in the model (see model 5). Topic x Stance effects on VOT are illustrated in **Figure 5.4.3.1.** Like the figures above, the **Figure 5.4.3.1.** illustrates the difference in VOT across lenis and aspirated stops on the Y axis, the critical feature that shows SK pattern of stop production. Different from the figures in topic only section, the VOT difference did show some numerical variation depending on topic x stance in **Figure 5.4.3.1.** It is notable that the magnitude of VOT difference was numerically the largest in NK positive (NKP) and slightly larger than that of VOT difference in NK neutral (NKNeu), the baseline of

speech. More importantly, it is also noteworthy that the magnitude of VOT difference is the smallest (more SK like) in NK negative (NKN).

Model (5) confirmed the second observation. Manner*Topic x Stance interaction is critical in the current analysis as it was in the previous analyses. The interaction term was significant in NKN ($p = 0.016$) as shown in **Table 5.4.3.1.** The results confirm that the NK speakers produced more SK-like VOT patterns compared to the baseline when they were speaking negatively about NK. VOT of the other Topic x Stance categories were not statistically different from that of baseline.

Recall that the NK speakers produced the most SK-like VOT patterns also in NKN (speaking negatively about NK) with the SK interviewer (Chapter IV). In addition, with the SK interviewer, their VOT distinction became significantly shorter in NKP, SKN, and SKP, showing more SK-like patterns, when they were speaking more emotionally with either positive or negative stances. With the NK interviewer, however, VOT shifting was observed only in NKN. Nonetheless, SK-like VOT patterns were observed in NKN, making us consider that the speakers were potentially performing SK place identity even when they talked with the NK interviewer. Unlike results in Nycz (2018), however, even with the NK interviewer, the NK speakers did not produce more SK-like VOT patterns when they talked about SK positively. In addition, more NK-like VOT patterns were not observed in either SK negative (SKN) or NK positive (NKP).

Figure 5.4.3.1. Effects of Topic x Stance on VOT of NK speakers

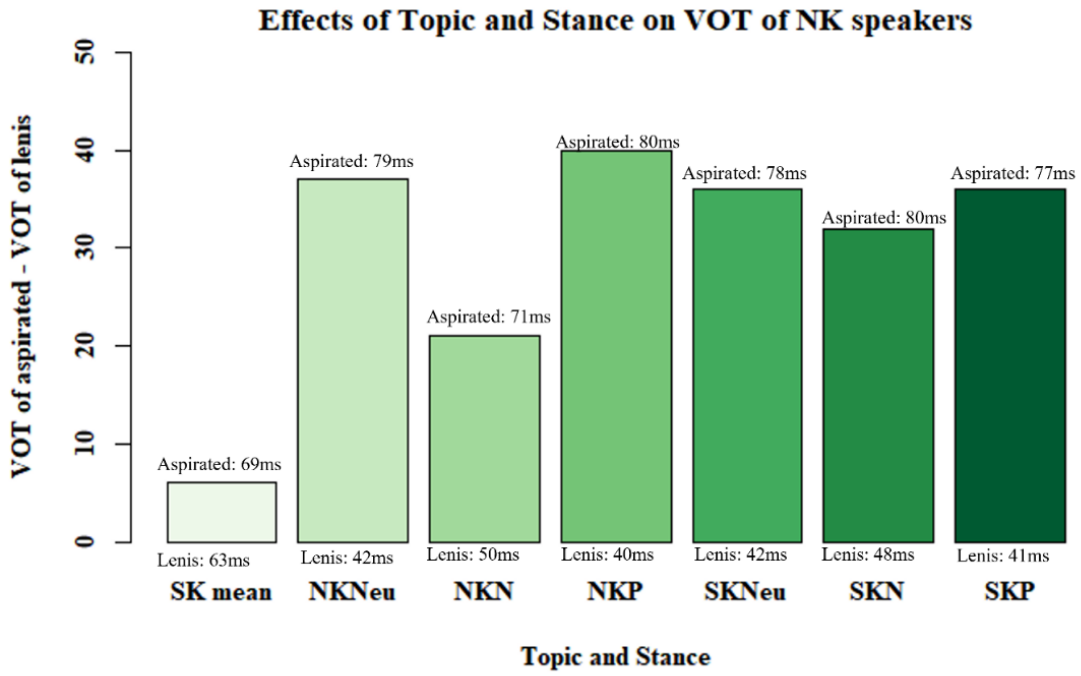


Table 5.4.3.1. The Output of Model (5) for Topic and Stance effects: Lenis and NKNeu are the reference category.

	VOT			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
Lenis	42.43	37.66 – 47.20	17.44	**<0.001*** **
Aspirated	78.04	71.03 – 85.05	21.82	**<0.001*** **
NKN	4.12	0.01 – 8.24	1.96	**0.050.**
NKP	-0.46	-4.27 – 3.35	-0.24	0.814
SKN	3.26	-0.88 – 7.41	1.54	0.123
SKNeu	1.25	-1.90 – 4.40	0.78	0.438
SKP	2.93	-2.94 – 8.81	0.98	0.328
Articulation rate	-12.13	-13.26 – -11.00	-21.04	**<0.001*** **
Aspirated*NKN	-11.27	-20.43 – -2.11	-2.41	**0.016** **
Aspirated*NKP	-1.03	-10.20 – 8.15	-0.22	0.827
Aspirated*SKN	-6.27	-20.01 – 7.46	-0.90	0.371
Aspirated*SKNeu	-3.79	-11.91 – 4.33	-0.92	0.360
Aspirated*SKP	-6.13	-15.35 – 3.10	-1.30	0.193

Significance. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1

5.4.3.2. F0

Topic x Stance effects on F0 are presented in **Figure 5.4.3.2**. It is noticeable that, numerically, the magnitude of F0 difference values was the smallest in NK neutral (NKNeu, thus, most NK-like F0 production) and the largest in NK negative (NKN) (thus, most SK-like F0 production in NKN). More interestingly, the magnitude of the F0 difference in NKN is numerically greater than that of SK speakers' F0 in Chapter II. Although the focus of this chapter is not a general SK-NK comparison, it is noteworthy to observe the more enhanced F0 effect in NKN than the mean of SKs' F0**.**

Model (6) did confirm the observations. Like other models above, the Manner*Topic x Stance interaction is critical in the current analysis. The interaction term in NKN was significant ($p = 0.012$, see **Table 5.4.3.2.**). The results show that the NK speakers did shift their F0 pattern to produce more SK-like F0 patterns in NKN. Even with the NK interviewer, when they spoke about North Korea negatively, they produced more SK-like F0 patterns, which could be interpreted as performing SK identity.

Figure 5.4.3.2. Effects of Topic x Stance on F0 of NK speakers

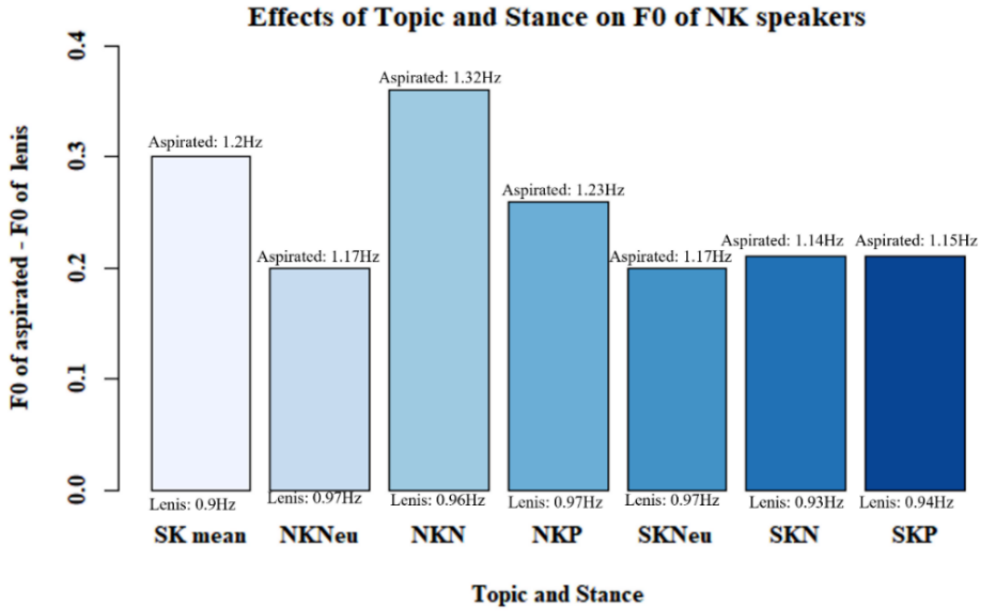


Table 5.4.3.2. The Output of Model (6) for Topic and Stance effects: Lenis and NKNeu are the reference category.

	F0			
Predictors	*Estimates*	*CI*	*Statistic*	*p*
(Intercept)	0.97	0.95 – 0.99	79.73	**<0.001*** **
Aspirated	0.20	0.14 – 0.26	6.33	**<0.001*** **
NKN	-0.01	-0.05 – 0.03	-0.56	0.574
NKP	-0.00	-0.05 – 0.04	-0.22	0.822
SKN	-0.05	-0.09 – -0.00	-2.09	**0.036***
SKNeu	-0.01	-0.04 – 0.03	-0.41	0.681
SKP	-0.04	-0.07 – 0.00	-1.89	0.059
Aspirated*NKN	0.16	0.04 – 0.28	2.53	**0.012****
Aspirated*NKP	0.06	-0.09 – 0.20	0.78	0.438
Aspirated*SKN	0.01	-0.18 – 0.20	0.11	0.912
Aspirated*SKNeu	0.01	-0.08 – 0.09	0.12	0.906
Aspirated*SKP	-0.02	-0.18 – 0.14	-0.27	0.784

Significance. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

5.5. Discussion

This Chapter examined effects of interlocutor, topic, and topic x stance with the NK interlocutor on the NK speakers' stop production, by investigating their VOT and F0 patterns. The following were the research questions addressed:

1) How does the different interviewer (SK vs. NK) influence the NK speakers' VOT and F0?
2) In the conversational speech with the NK interviewer, how do Topics (NK vs. SK) influence the NKs' stop production?
3) In the conversational speech with the NK interviewer, how do the NK speakers shift their stop production depending on topic and stance?

To address the first research question, interlocutor effects were examined. I hypothesized that the NKs' stop production would be different depending on the interlocutor's origin (SK vs. NK) based on prior literature (e.g., Rickford and McNair-Rox 1994). The results confirmed that interlocutor significantly influenced their stop production. First, the NK speakers produced lenis and fortis stops with significantly shorter VOT with the SK interviewer than with the NK interviewer. In terms of F0, they produced aspirated stops with significantly higher F0 with the SK interviewer than with the NK interviewer. Thus, both of VOT and F0 distinction were more enhanced when they spoke with the SK interviewer. In contrast, with the NK interviewer, they distinguished both VOT and F0 between lenis and aspirated stops to a significantly lesser degree.

We observed the diminished VOT distinction between lenis and aspirated between the NK speakers and the NK interviewer. Although this pattern could be taken as

SK-like stop production, I think it might be a case of casual speech due to speaking with a familiar speaker in this case. A more distinguished VOT and F0 between lenis and aspirated stops are related to acoustic features of clear speech in SK (Oh et al., 2018; Kang & Guion, 2008; see also Chapter I). Previous research has reported that speakers tend to hyperarticulate to speak carefully in formal speech (Koster, 2001; Smiljanic & Bradlow, 2008; Kang & Guion, 2008; Idemaru & Oh, 2018, see also Chapter I). The NK speakers spoke more formally in the polite register when they conversed with the unfamiliar SK interviewer. The link between formal speech and polite speech has been reported (Winter and Grawunder 2012; Oh, Idemaru, Winter, 2021), likely resulting in the NK speakers speaking more clearly, distinguishing both VOT and F0 between lenis and aspirated stops to a greater extent when speaking with the SK interviewer. This indicates that the NK speakers might be aware of VOT and F0 as politeness/formality cues in SK.

Next, effects of topic, and topic x stance were examined. Note that both findings in Chapter IV and Walker (2014) reported that topic by itself did not influence their speakers shifting between D1 and D2 varieties. Based on the findings, I hypothesized that topic also did not affect the NKs' stop production with the NK interviewer. This hypothesis was supported.

When topic was combined with stance, we did observe significant effects. In Nycz (2018), her speakers produced more D1-like vowels when they talked about D1 positively. More D2-like vowel was observed when they spoke about D2 positively. In other words, the speakers in Nycz (2018) performed 'place identity' of the relevant place when they expressed positive stance to the region whether it was D1 or D2. Unlike the

findings in Nycz (2018), the NK speakers showed more complex patterns of shifting and pattern varied whether they were speaking to the NK interviewer or the SK interviewer. When speaking with the SK interviewer, the NK speakers seemed to show SK identity (with SK-like VOT pattern) in a range of topic x stance contexts, namely, when speaking with a stance, positively or negatively, but more so when talking negatively about NK. Here, I considered the possibility that the NK speakers, vulnerable in the SK society, performed SK place identity as they spoke emotional, thus sensitive, contents, perhaps feeling a need to distance themselves from NK and to protect themselves as they were speaking to an unfamiliar SK person. Their F0 did not vary across these factors, however. I considered the possibility that the NK speakers were using prosodic mitigation strategy (e.g., Hübscher et al., 2017) that levels prosodic features when speaking politely.

With the NK interviewer, as discovered in this chapter, both VOT and F0 significantly shifted but only when they spoke negatively about NK. Thus, even with the NK interviewer, they produced more SK-like stops, when they talked about North Korea negatively. These results seem to confirm that the speaking negatively about North Korea triggers NK speakers to take on SK place identity. This might be a result of the NK speakers distancing themselves from North Korea as they reflect on undesirable aspects of their lives back home. Alternatively, the results might also be related to NK speakers' vulnerable refugee status in South Korea, which often leads them to be cautious about revealing their identity (Kim and Jang, 2007; see also Chapter I). They might still perform a strong degree of SK identity as a way of protecting themselves when they express a negative stance towards North Korea, even when speaking another North Korean person. However, it is unclear whether they are distancing from NK or trying to

assimilate to SK as they perform SK identity. They may be doing both. Future research may address this question by investigating relations between style shifting and Adaptation scores in more depth. More specifically, by focusing on the NK speakers' experiences as a NK refugee in South Korea, their Adaptation scores can be reassessed. How their experiences in South Korea and Adaptation scores affect topic shifting can be investigated. This will be also more discussed in the next chapter.

Chapter VI. Conclusion and Future Directions

More than 30,000 North Korean refugees have escaped from North Korea and settled in South Korea (Ministry of Unification, 2015; see Chapter I). Among other pressures in resettlement, North Korean speakers struggle with adjusting to South Korean society because of the linguistic divergence between the two countries that has emerged due to 72 years of physical and political separation (Kim & Jang, 2007; see Chapter I). A more recent divergence has emerged in the three-way stop contrast (fortis, lenis vs. aspirated) resulting from a change in standard South Korean (SK) during the early 2000s. Traditionally, the stops were distinguished solely by voice onset time (VOT) in SK. However, whereas fortis stops have not gone through changes, the SK variety's lenis and aspirated stops now mostly overlap in VOT and are distinguished by F0 in the following vowel in conversational speech (e.g., Silva, 2006; see Chapter I). In order to successfully assimilate to South Korean society, the new way of producing stops in South Korea may be an important speech cue that the North Korean refugees have to acquire.

Previously, North Korean refugees have reported that one of the major struggles in adjusting to the SK speaking community is due to their North Korean accents and difficulties in acquiring SK (Kim & Jang, 2007; see Chapter I). Although they have been discriminated against because of their NK accent, second dialect acquisition of NK speakers has been understudied. More specifically, given that F0 is now a more prevalent cue in SK varieties, it is unknown to what extent NK speakers have acquired this new cue in South Korea. To what extent NK speakers' pronunciation varies from the SK speakers and to what extent they assimilate their production, by acquiring the new manner of SK stops, is also understudied. In addition, to what extent various sociolinguistic factors

influence the NKs' stop acquisition has also not been investigated carefully in the previous literature.

The current study aims to contribute to the second dialect acquisition field, beyond the findings in previous studies. First, standard North Korean (NK) variety has not been examined in depth and directly compared to standard South Korean (SK) variety. Previous literature (Lee,1991; Kang,1995, 1996, 1997, 1999; and Kang & Yun, 2018) mainly investigated production of Hamkyong North Korean dialects and attempted to compare production between Hamkyong and Seoul Korean varieties. However, it was unclear how standard NK variety is different from Hamkyong North Korean dialect in terms of speech production. Moreover, because stop production of NK and SK have also not been compared in depth, it was also unclear to what extent stops are articulated differently in North and South Korean standard varieties. Chapter II examined three relevant cues in stop production: i) VOT, ii) F0, and iii) H1-H2. In addition, each cue of the stops was statistically compared, using experimental and empirical methodologies. Thus, I provided the most updated results in terms of stop production in both NK and SK, analyzing three different acoustic cues.

In addition to providing acoustic analyses of stop production in NK and SK, this dissertation provides essential data in second dialect (D2) acquisition. In previous literature, second dialect acquisition of geographically mobile speakers has been well-documented (e.g., Siegel, 2006). However, among the various sociolinguistic factors like AoA, LoR, and attitudinal factors (identity, assimilation, and language attitudes), it was unclear to what extent each factor can uniquely predict and contribute to or how they interact in D2 production (Siegel, 2006). This is because all the factors have not been

included in the prior research. Moreover, each factor has also not been assessed in the statistical model. Unlike the previous literature, Chapter III included numerous possible factors, all of those that have been identified as important in the literature, that influence D2 acquisition and examined the weight of each factor in the statistical model. In other words, I examined to what extent each factor contributes to D2 acquisition (SK) in stop production. Along with AoA and LoR, various sociolinguistic factors, including Identification, Assimilation, and Language attitude were assessed in the NKs' stop production. In addition, by using model comparison, I identified the most predictive factor in D2 acquisition (SK-like VOT and F0 production), relative to all of the other factors. The key findings are summarized in the following sections.

Chapter IV addressed topic-based style shifting by NK speakers based on two previous studies (Walker, 2014; Nycz, 2018). Walker (2014) examined speech production and topic-based style shift of American and British expatriates in read speech condition. Nycz (2018) investigated topic-based style shift of D1 Canadian English speakers. In her study, place identity of the D1 Canadian speakers was examined. Her participants produced D1 or D2 (Washington, New York English) like vowels to show assimilation and dissimilation towards D1 and D2 region. Unlike those two studies, the current study investigated more vulnerable populations, NK refugees, in South Korea. Unlike the American, British, and Canadian English speakers in previous studies, NK refugees are less fortunate and in a more insecure situation. They had to escape from the poverty in North Korea in order to live in South Korea for a better life. They risked their own life to cross over the North Korean border and detour many countries over three months to receive refugee status in South Korea. Nonetheless, they are often targeted in a South

Korean community solely because of their origin (North Korea) and accent. Thus, the social status of NK refugees and those of participants in previous studies are different, which makes the setting of current study unique. In addition, unlike Walker (2014) who analyzed topic-based style shifting using word lists about the U.S. and U.K., Chapter IV investigated effects of topics on NKs' stop production, using natural conversational speech data. Moreover, unlike Nycz (2018), who compared the NKs' baseline stop production (NK neutral), I examined the effects of various topic and stance (NK negative, NK positive, SK neutral, SK negative, SK positive) in more depth.

In the previous chapter, possible influences from the SK interviewer were discussed. Based on the findings through Chapter IV, Chapter V conducted an additional follow-up study to examine interlocutor's effects on the NKs' stop production. Chapter V revealed that the NK speakers' stop production was different across the two interviewer's origin (SK vs. NK). Moreover, I also discovered to what extent topic and stance differently influenced the NKs' stop production across the two interviews. Chapter V not only complemented previous chapters but also provided acoustic data between NK speakers, which contributes to understanding of D2 learners' speech patterns in second dialect acquisition field. The following section summarizes the findings of the previous chapters.

6.1. Comparison between NK and SK stops in each speech condition

Chapter II aimed to confirm the differences between NK and SK stops. Stop production of NK and SK speakers were compared in three different speech conditions (reading nonce words, phrases, and conversational speech), examining VOT, F0, and H1-

H2. The results demonstrated that the NK speakers produced the three-way stop contrast differently from the SK speakers, in terms of VOT and F0 and specifically lenis and aspirated stops. The current study mainly focused on the extent to which NK and SK speakers use acoustic cues to distinguish between lenis and aspirated stops differently. Thus, I will summarize the results more focusing on differences in lenis-aspirated.

First, the SK speakers' stop production was mostly aligned with previous literature. They significantly distinguished the VOT and F0 of fortis, lenis and aspirated stops in reading the nonce word condition (VOT: fortis < lenis < aspirated, F0: lenis < fortis < aspirated). However, like the results in previous literature, in both the reading phrase and conversational speech condition, the SK speakers did not significantly distinguish VOT between lenis and aspirated stops but significantly distinguished F0 between lenis and aspirated stops (VOT: fortis < lenis = aspirated, F0: lenis < fortis < aspirated). This seems to indicate that, both cues of VOT and F0 were distinguished in SKs' careful speech (i.e., reading nonce word), likely showing a clear speech strategy (Kang & Guion, 2008; see also Chapter I).

In terms of H1-H2, the SK speakers used breathier voice quality following lenis and aspirated stops in careful speech. Their fortis stop was differentiated from lenis and aspirated as fortis was followed by creakiest voice quality. In conversation, however, the SK speaker's fortis and aspirated stops were followed by creaky vowels, and the two were differentiated from more breathy lenis stops. H1-H2 of SK speakers in conversational condition has not been examined in depth so far to my knowledge. Given that the most recent study that examined voice quality of SK stops in careful speech only

was in 2013 (Oh & Yang, 2013), this dissertation may present the most updated H1-H2 in SK stops in both careful and conversational speech.

The NKs' stop production was majorly different from the SKs' stop in terms of VOT and F0, while being similar for H1-H2. Thus, I focused on the analyses of VOT and F0 in following chapters. First, unlike the SK speakers, in all speech conditions, the NK speakers significantly distinguished VOT between lenis and aspirated stops, which was similar to older SK speakers who were born before 1964 (Silva, 2006). In addition, in reading nonce word condition, the NKs' stop production was similar to Yanbian speakers in Oh and Yang (2013). The Yanbian NK speakers, in Oh and Yang (2013) and in the nonce word condition of the current study, did not significantly distinguish VOT between lenis and fortis but did distinguish VOT between lenis and aspirated stops (VOT: fortis = lenis < aspirated). Moreover, they did not differentiate F0 between lenis and aspirated stops (F0: lenis = aspirated < fortis). Recall that the contemporary SK pattern is the VOT merger across lenis and aspirated and recruitment of F0 to distinguish them instead. Note that the participants read aloud one syllable nonce word in this condition. Thus, the reading nonce word condition can be viewed as one that elicited the most attention-to-speech production. When the NK speakers were able to pay attention to their speech, however, they did not produce SK-like stops. Instead, they distinguished VOT between lenis and aspirated but did not distinguish F0 between lenis and aspirated stops, which may present their original NK stop patterns. However, in both reading phrases and conversational speech, the NK speakers' VOT production was more similar to the older SK speakers in Silva (2006). They significantly distinguished the three-way stop

contrasts using both VOT and F0 (VOT: fortis < lenis < aspirated, F0: lenis < fortis < aspirated).

However, the degree of distinguishing VOT and F0 differed depending on the speech conditions. For example, when NK speakers were reading nonce words, the VOT between lenis and aspirated was distinguished the most but did not distinguish F0 between lenis and aspirated. Thus, the most NK-like stop patterns (or the least SK-like stop patterns) appeared in this condition. However, in reading phrases and conversational speech with the SK interviewer, the VOT between lenis and aspirated stops was less distinguished but the F0 between lenis and aspirated stops was more distinguished, showing more SK-like stop production. Thus, in the conversation speech condition, their stop production was more SK-like, unlike the prediction of attention-to-speech model (Labov, 2006). In Labov (2006), nonstandard language speakers produced more standard-like pronunciation when they could pay attention to their own speech while they produced more nonstandard vernacular in conversational speech. It was noteworthy that the NK speakers in the current study showed opposite patterns from the findings in Labov (2006). NK speakers produced nonstandard pattern of stops in careful speech condition, and more standard-like pattern in conversational speech. The results raised the possibility that the SK interlocutor might affect their stop production in conversational speech. This was further examined in Chapter V.

6.2. Effects of AoA, LoR, Adaptation (Identification, Assimilation, and Language attitude)

Chapter III investigated the effects of various sociolinguistic factors such as age of arrival (AoA), length of residence (LoR), and each of Identification, Assimilation, and Language attitude score) on the NKs' stop production. I address the question which factor predicts more SK-like VOT and F0 patterns, among the various factors. To answer the research question, by including all the factors, the weight of each factor in the best fit model was examined. Moreover, as a post-hoc investigation, responses from the speakers who showed extraordinary patterns were also individually examined.

First, it is noteworthy that different factors affected VOT and F0. Specifically, LoR was the most significant predictor of more SK-like VOT patterns. The next most important factor was Identification score. In other words, the longer the NK speakers live in South Korea, the more they produce SK-like VOT patterns. The NK speakers with stronger SK identity could produce more SK-like VOT. In terms of F0, interestingly, Language attitude score was the most significant predictor to produce more SK-like F0 patterns. The second most important predictor was LoR. Thus, to raise F0 of aspirated stops like SK speakers, it is important to have more positive Language attitudes towards SK language. And a longer LoR additionally influences this.

To produce more SK-like VOT and F0 patterns, Identification, Language attitude and LoR were significant factors. The results are different from what has been discussed in previous literature in the second dialect acquisition field. Specifically, unlike the results in previous literature (Siegel, 2010; Nycz, 2019), AoA and Assimilation score were not significant predictors in this study. To produce SK-like VOT and F0 patterns,

LoR was a more important factor than AoA. The results might be due to the demographic characteristics of participants in this study. Specifically, the longest LoR of participants in the previous studies was over 40 years (e.g., Siegel, 2010; Kerswill, 1994). However, the longest LoR in this study was only 10 years and more than half of participants had less than 3 years of LoR. Note that Flege and Bohn (2021) has argued that effects of LoR might be more influential in the first few years (0 ~ 5 Y) to acquire L2 speech feature. It has little been studied to what extent LoR (less than 5 years) influenced D2 acquisition in the field; however, L2 and D2 acquisition might be related to each other and share similar processes (Siegel, 2010). Thus, because my participants LoR were relatively short (less than 10 years), the effect of LoR might have been more dominant.

Next, it was noteworthy that Assimilation score did not significantly predict more SK-like stop production. In other words, even if the NK speakers were adjusted and assimilated well in SK society, they still might not be successful in acquiring the SK stop features. Note that the NK speakers responded positively about Assimilation in South Korea in Chapter III, in general. More specifically, they reported that they were satisfied with living in a clean, economically developed, and welfare country. The materialistically 'better' environment in South Korea might have led to a higher Assimilation score. However, more satisfaction (which would lead to high assimilation scores) with material convenience might not have led NK speakers to necessarily acquire SK-like stops. This may be related to the unfortunate context in which the speakers ended up in the D2 region. It's likely they would not have left their country if political and economical situation was better at home. Thus, in the case of NK refugees, Assimilation score might not be as critical as Identification and Language attitude score in acquiring second dialect

features. These findings highlight that the factors that affect D2 acquisition are likely influenced by the situations surrounding the speakers' relocation to their D2 region.

Among the NK participants, there were individuals who showed more NK-like patterns of VOT and F0 and those who showed more SK-like patterns of VOT and F0. We called them extraordinary dissimilators and assimilators. Interestingly, dissimilators were not necessarily dissimilators for both VOT (n = 1) and F0 (n = 4); and assimilators were not necessarily assimilators for both VOT (n = 3) and F0 (n = 4). Only speaker #20 was both extraordinary VOT and F0 dissimilator. And speaker #18 was the only extraordinary assimilator in both VOT and F0. In most cases, between VOT and F0, a majority of NK speakers assimilated only one cue. Because the individuals might each notice the acoustic cues differently in SK stops, they may solely rely on one of cues.

F0 is now a more salient cue to distinguish lenis and aspirated in SK (see Chapter I). There were six male speakers among the NK group and these male NK speakers showed interesting patterns in terms of the use of F0 (or more accurately lack of the use of F0) in stop production. As discussed earlier, male speaker #20 dissimilated both VOT and F0. The other five NK male speakers assimilated VOT patterns, but they did not assimilate F0. Moreover, four out of six were categorized as 'extraordinary' in F0 dissimilator group. Thus, even though the four NK males stayed in South Korea for an average of 6.8 years, they still have less distinguished F0 between lenis and aspirated stops. Interestingly, except for one NK male speaker (#6), they generally responded that they were very satisfied with living in South Korea and assimilated in SK society. However, all of them reported that they were not willing to acquire SK because it

sounded too feminine, childish, immature, soft, and friendly, compared to NK (see also Chapter III).

Previous studies have reported that higher F0 has social meanings of femininity and softness in general (e.g., Idemaru et al., 2018). In addition, standard varieties can be often evaluated as more feminine than nonstandard varieties (e.g., Pharao et al., 2014; Ladegaard, 2010; see also Chapter I). In contrast, it has been reported that nonstandard varieties can be often judged as more masculine (e.g., Pharao et al., 2014, and see also Chapter I). Thus, SK variety might also have social meanings of femininity and softness whereas NK variety may have social meanings of masculinity. Therefore, given that the NK speakers' D1 (NK) and D2 (SK) and each cue (VOT and F0) can have different social meanings in terms of gender, the NK speakers might have subconsciously noticed those social meanings and controlled their speech, by using each cue differently in their production. The current dissertation did not aim to investigate to what extent NK male and female speakers acquire SK-like stop patterns differently and only included 6 NK male speakers; however, relations between 'gender (e.g., masculine) identity' and acquisition of standard D2 variants can be examined in a future study.

Chapter III represents a first attempt to investigate sociolinguistic factors and identify the most significant predictor among the various sociolinguistic factor in second dialect acquisition. In the case of NK refugee speakers in South Korea, LoR, Identification, and Language attitude were important predictors to produce SK-like stop patterns.

6.3. Topic and Topic x Stance

Chapter IV investigated effects of topic and the topic x stance interaction on the NKs' stop production. First, recall that, in Walker (2014), the effect of regional topic (U.K. vs. U.S.) was small and inconsistent. Thus, topic itself did not affect her speakers' production. Like her findings, the regional topic (North Korea vs. South Korea) did not influence the NKs' production in Chapter IV. In terms of topic x stance, recall that, in Nycz (2018), positive stance towards regional places (D1 vs. D2) was more associated with the shifting in production. Specifically, her participants produced more D1-like vowels when they talked about D1 positively and produced more D2-like vowels when they spoke about D2 positively. Based on Nycz (2018), Chapter IV also examined to what extent the NKs shift their stop production due to topic x stance, comparing to their baseline of stop production (NK Neutral). Topic and Stance were also coded and followed the methodologies that were suggested by Nycz (2018). Topic x Stance had six categories: i) NK Negative, ii) NK Neutral, iii) NK Positive, iv) SK Negative, v) SK Neutral, vi) SK Positive. In Chapter IV, again, like the previous chapters, the NK speakers conversed with the SK interviewer, using honorific speech (*contaysmal*).

In Chapter IV, the results were different from the findings in Nycz (2018). First, each cue (VOT and F0) behaved differently across the topic and stance. The NKs' VOT fluctuated depending on topic x stance; however, their F0 was consistent regardless of topic x stance. First, in terms of VOT, the NKs' VOT was the most NK-like (more distinguished) in NK Neutral. Thus, when they delivered information about North Korea without any emotions, they produced the more NK-like VOT patterns. Statistically, the NK speakers showed more SK-like VOT patterns in NK Negative, NK Positive, SK

Negative, comparing to the stops in NK Neutral and SK Neutral. It was also noteworthy that they produced numerically the most SK-like VOT patterns when they talked about North Korea negatively to the SK interviewer. In other words, the NK speakers performed 'SK identity' by producing the least distinguished VOT between lenis and aspirated (thus, the most SK-like VOT) when they talked about regional topics with emotional stances. More critically, differently from Nycz (2018), they did not produce more SK-like production in SK Positive or produce more NK-like production in NK Positive. Chapter IV discussed that the more SK-like VOT in NK Positive and SK Negative might have been due to the unfamiliar SK interviewer. Note that the NK speakers were not familiar with the SK interviewer, and they only met once and for the first time in the interview. Thus, they spoke to each other using more formal and polite speech style (called *contaysmal* in Korean). The situation might not be comfortable for the NK speakers to speak with emotional stances about potentially sensitive matters such as complaints about SK and complaints and praises about NK. Thus, they might align their speech to that of the SK interviewer especially when they are speaking about these sensitive matters in their efforts to guard themselves. Because of these findings the possible interlocutor effects were examined in Chapter V.

Unlike the noticeable fluctuations of VOT, the NKs' F0 was not significantly affected by the topic x stance condition in the statistical results. Chapter IV discussed that the consistent F0 might also be due to the unfamiliar SK interviewer and the use of polite speech style *(contaysmal)*. Cross-linguistically, speakers tend to speak with less variation in pitch and loudness in polite speech compared to casual speech (e.g., Hübscher et al., 2017) and this has been observed for Korean (e.g., Idemaru et al., 2019). Thus, because

the NK speakers might have tried to speak more politely to the unfamiliar SK interviewer, their F0 might not shift depending on topic x stance. Overall, the results illustrated that the NKs' topic-based stop shifting might have been influenced by the SK interviewer. Further chapter (Chapter V) investigated the possible impacts of interlocutor on the NKs' topic-based stop shifting.

6.4. Interlocutor effects

The results in previous chapters raised the possibility of an influence from the SK interviewer. As a follow-up study, Chapter V examined the interlocutor effects (SK vs. NK). It has been reported that nonstandard speakers restrain their nonstandard variants with a standard speaking interlocutor but use more vernacular variants in conversation with a nonstandard speaking interlocutor (Rickford & McNair-Knox, 1994). Like the findings in previous literature, I also hypothesized that the NKs' stop production might be different in a conversation with a NK interlocutor.

To investigate how the NK speakers differently produce stops with the NK interviewer, 6 of the 22 NK speakers returned to participate in the sociolinguistic interview with the NK interviewer. In general, the 6 NK speakers significantly distinguished both VOT and F0 between lenis and aspirated as they spoke with the NK interviewer. However, the degree of distinction was different from the VOT and F0 patterns with the SK interviewer. First, with the NK interviewer, the 6 NK speakers distinguished both VOT and F0 less than with the SK interviewer. This means that the two cues showed contradicting directions in terms of NK and SK patterns, with VOT showing a SK-like pattern and F0 showing a NK-like pattern when speaking with the NK

interviewer. However, viewed another way, these patterns could be seen as NK speakers enhancing both cues when speaking with the SK interviewer, while they produced less clear stops when speaking with the NK interviewer.

Recall that more distinguished VOT and F0 between lenis and aspirated stops can be a mark of clear speech in SK variety. In previous studies, younger SK speakers enhanced distinction of both VOT and F0 between lenis and aspirated stops in clear speech condition with a larger extent than in casual speech (e.g., Kang & Guion, 2008; see also the results of SKs in reading nonce word condition in Chapter II). Given that the more enhanced distinction of VOT and F0 between lenis and aspirated are acoustic cues of clear speech in SK (e.g., Kang & Guion, 2008), the NK speakers might enhance both cues to speak more clearly to the SK interviewer, with whom they met for the first time and spoke using a formal honorific speech style.

The NK speakers were familiar with their NK interviewer, and they spoke with each other using an informal speech style. Thus, with the NK interviewer, the NK speakers might feel more comfortable so that they used the less robust cues for both VOT and F0. Thus, they might produce stops with casual style speech because they did not have as much pressure to speak more clearly and politely to the NK interviewer. The design of this study inevitably included three confounding factors that differentiated the two interview settings. On one hand, the first interview was with an unfamiliar SK individual and consequently an honorific speech style was used during the interview. On the other hand, the second interview was with a close NK friend and consequently a non-honorific speech style was used. Thus, between familiarity, being an NK person, and non-honorific speech style, it is still unclear which factor has influenced their more

'casual' (i.e., less enhanced) stop production in the second interview. A future study can conduct a production study to examine complex relations among interview's origin, familiarity with the interviewer, address type and stop production.

6.5. Interlocutor x Topic, and Topic x Stance

When the 22 NK speakers had conversation with the SK interviewer, their stop production showed some variation due to topic and stance combinations (Chapter V). Namely, they produced the most SK-like VOT in NK Negative and their VOT also fluctuated more in NK Positive, SK Negative, and SK Positive. In contrast, their F0 did not change due to the topic and stance. As noted above, the results might have been influenced by the SK interviewer. As a follow-up study, in Chapter V, I investigated the interlocutor's effect (interviewer's origin: NK) on topic x stance shifting. Because the NK speakers talked with the familiar interlocutor from the same origin more comfortably, I hypothesized that they may produce more NK-like stop patterns in NKP and SKN. In general, I predicted that they might perform more 'NK identity', by producing more NK-like stop patterns. However, this hypothesis was not supported.

Contrary to my prediction, shifting did not occur toward NK patterns. Instead, even with the NK interviewer, the NK speakers performed SK identity, by producing the SK-like VOT and F0 patterns when they talked about North Korea negatively. Unlike the patterns in Nycz (2018) and interestingly, the NK speakers did not perform NK identity in NK Positive or SK Negative. They also did not perform SK identity in SK positive. Thus, their production was closer to SK-like stops than to NK-like stops in NK Negative.

In NK Negative, they might have been in pressure to speak more like South Koreans in order to keep distance from North Korea.

The most SK-like stop patterns can be elicited in negative stance toward NK topics, and thus, be more associated with NK Negative. These unique results might be related to the speakers' refugee status in South Korea. As discussed earlier, NK speakers are often discriminated against in SK society because of NK accent and also experience identity conflict (Kim & Jang, 2007 and see also Chapter I). Thus, the unstable and vulnerable refugee status might generate interesting and different patterns from the previous literature. Regardless of the interviewer's origin, the NK speakers produced the most SK-like stops. Speaking about D1 negatively might enhance producing D2 features more and be helpful to acquire D2 features. This can be further studied from pedagogical approach in second dialect acquisition field, which will be further discussed in the next section.

6.6. Conclusion

The current study examined NK speakers' stop production from the perspective of second dialect acquisition. The findings demonstrated that the NK speakers investigated here are likely in the process of acquiring SK-like stop production. While none of them showed complete acquisition of the SK stop patterns, the speakers as a group showed some level of acquisition of the SK pattern of stops in their production repertory. We now understand that the longer they have stayed in South Korea, the more learning of SK pattern they show. However, we also learned that social factors modulate the degree of learning the SK pattern: if speakers identify themselves with South Korea (VOT) and if

they have positive attitudes toward the South Korean variety (F0), they are likely to learn the stop patterns better. This means that even though NK refugees may struggle with negative perceptions toward their accented speech in South Korea, for some speakers, it may be their sense of (NK) identity and (negative) attitudes toward the South Korean dialect that may be preventing acquisition of the SK variety. At the same time, even for speakers with strong identification with South Korea and positive attitudes toward the dialect, their pattern did not reach the SK level. These findings indicate that while NK speakers may be aware of the usage pattern of VOT and F0 for SK stops, they may not have the production target. We also learned that some speakers, particularly male speakers, may not be willing to acquire some SK patterns.

When acquisition is not complete, the target D2 form may not always be produced by second dialect speakers. The current study underscored the importance of examining variability in second dialect learners' speech. My findings have demonstrated that changing speech tasks, topics (that may lead to varying stances), and the interlocutor could elicit a range of production patterns, including more D1-like production and more D2-like production. Examining just one task and limited topics may fail to reveal a D2-like repertory, and one may conclude that acquisition is not happening. But when we discover that some contexts prompt the use of D2-features while others do not, we gain a more detailed understanding of the phenomena.

In regard to this point, of particular interest was the finding that the NK speakers showed the greatest level of acquisition when they spoke negatively about North Korea, whether they were speaking to a South Korean interviewer or to a North Korean interviewer. As I discussed earlier, this seems to reflect the vulnerable standing of NK

refugees, who might feel the need to watch how they are speaking when speaking about sensitive or political issues. Given the current findings, the idea that positive topics about D1 region may lead to the use of D1 features and positive topics about D2 region may elicit the use of D2 features (Nycz 2018) may be too simplistic. The current findings suggest that we need to consider the power dynamics of the D1 and D2 regions and the status of target speakers in the D2 region carefully in considering second dialect acquisition.

6.7. Limitation and Suggestions for further research

The dissertation primarily focused on speech production and did not include a perception study. However, speech cues identified as robust in production studies are not always robust in perception. If the current study included a perception experiment, it would be more helpful to understand which cue is more prominent perceptually in each dialect. For example, do NK listeners living in SK rely more on VOT than F0 in perceptually distinguishing lenis and aspirated stops? My production findings would predict so, but it is an empirical question. Also, do NK listeners change the perceptual weight of VOT and F0 depending on whether they are listening to NK speakers or SK speakers? Perception studies would allow us to gain further knowledge regarding NK speakers' D2 acquisition.

My production study showed that the NK speakers' stops were different from the SK stops. We do not know, however, whether these differences matter perceptually. In other words, are NK speakers judged as being accented because of their stop production patterns? And is the perception related to more subjective judgment such as education

level, friendliness, and so forth? These perceptual studies will address the production–perception link of the stop patterns and the potential source of the negative perception of the NK variety.

There is also an issue related to the number of participants tested in this study. Among the 22 NK speakers, 16 were females and 6 were males. It could have been better if I had recruited 11 NK females and 11 NK males. A gender balanced pool of participants would have allowed me to examine the effects of gender, for example, how masculine identity influences producing SK-like stops. Given that all six male NK speakers tended to produce more NK-like F0 patterns in stops, it might be useful to investigate relations between gender identity and acquisition of standard D2 variety with more NK male speakers in the future. Note that, in many countries, standard language variants are often considered as 'feminine, higher socioeconomic class, gay, and intelligent' whereas nonstandard variants are judged 'masculine, immigrant, lower socioeconomic class, tough, and less intelligent' (Pharao et al., 2014). In other words, if the nonstandard D1 male speakers have stronger masculine identity, they might be more likely to have negative attitude toward standard D2 language and not to acquire D2 features. This may have been the case in this study; however, lacking a gender-balanced pool of speakers, I could not conduct this analysis. Future studies can investigate relations among gender, gender identity, and second dialect acquisition, by including 20 NK females and 20 males.

In addition, Chapter V inevitably included compounding factors: i) familiarity (acquaintance vs. close friend), ii) politeness (*contaysmal* vs. *panmal*), iii) interviewer's origin (SK vs. NK), iv) interview timeline (2018-2020 vs. 2021). Future studies might

address teasing apart these complicated factors, by conducting the two different interviews with similar conditions in the same year. This can examine effects of familiarity, politeness, interviewer's origin, and LoR on the NKs' stop production.

APPENDICES

A. APPENDIX: Interview questions for NK participants (modified from Tagliamonte, 2006)

<Questions>

Topics	General questions	Compare SK-NK	NK-focus	SK-focus
Number of topic-based questions	3	5	5	4

1. Very common opening questions for both genders **(General)**
   (1) Wow, your skin/makeup/fashion/earing and so on is so beautiful. Where did you buy that? What is your tip for skincare? I fall behind of all the Korean stuffs because I live in the U.S. Please recommend me some.
   (2) What kind of fashion style do you like? (hipster/feminine/dandy…)
   (3) Where do you usually go for hair treatment? Where did you get your hair style?
   (4) What kind of delicious food did you try/eat recently? Where/why/who did you go? I missed Korean foods a lot. Could you recommend me some?
   (5) How do you find good restaurants? (internet/friend/community and so on)

2. Demographics **(General)**
   (1) Let's see, your name is…
   (2) And your hometown is… North-east part? North-west part? which province are you from in North Korea? (Should ask broadly such as Hamgyung Nam do and Hamgyung buk do)
   (3) Where was the first place that you lived in North Korea?
   - And, where did you live next?
   - Why did you move (if you remember)?
   (4) How many years of school did you get a chance to finish?
   (5) What types of work have you done in North Korea when you left school?
   - How long did you do that?
   - And, what did you do (specifically) in the working place?

3. Hobby **(General)**
   (1) What do you usually do in your free time?
   (2) Do you like going to cute cafes? Where do you usually enjoy drinking coffee or eating deserts? What kinds of menu do you usually order and why? And who do you go there with?
   (3) Do you enjoy watching sports? What sports team do you like? And where do you usually watch games?
   (4) Have you watched any drama or movie recently? How was it?

(5) What is your favorite movie? Would you recommend it to others?
(6) What kind of music do you like? What kind of music are you listening to these days? Have you ever been to a concert to see one of your favorite groups? How was it?
(7) What's the best concert you were ever at? Who's your favorite artist? How come?
(8) Do you/have you done any volunteer work?
(9) Do you play any musical instruments? If yes, which ones? For how long? What made you start? e.g. school, parents If no, is there an instrument you would like to learn to play? Why?

4. Dating practice **(Compare NK-SK)**
   (1) Do you currently have boyfriend/girlfriend here (SK)/or did you have a partner in NK? Where/how did you meet her/him? If not, what kind of style do you like to meet?
   (2) When you have a date in NK/SK, where do you usually go/what do you usually do with her/him?
   (3) In NK, when did you (or your friends) start dating? How did your parents react? How long did you date? Do you think NK people start dating earlier or later than SK people?
   (4) Did you ever have a boyfriend/girlfriend that your parents/friends didn't like in NK and SK? What kind of effort did you do to convince your parents?
   (5) Do you think there's such a thing as a "generation gap" in NK too? Or, are NK people more generous about generation gap than SK people?

5. Neighborhood **(NK-focused)**
   (1) Did you feel that your neighborhood in NK is safe when you were growing up? Why or why not?
   (2) Did you know any of your neighbors in NK? What are they like? Some people say that nowadays everybody's just too busy to just stop by to chat. What do you think? Why do you think that has changed?
   (3) Did NK people from around drop by to visit your hometown in NK?
   (4) Was there anyone you know well enough, just to walk in? Who would invite you in for coffee, just talk in NK?
   (5) Was there any neighborhood place where people get together in NK? Where they can go for a cold drink or tea/coffee in the afternoon? Evening? Is there a local pub/bar that you go to a lot?
   (6) What did you like best about your neighborhood in NK? What were the things that make you feel good/bad about your neighborhood?

   - Neighborhood **(SK, compare NK-SK)**
   (7) How do you think about your current neighbors in SK?
      a. How are NK/SK neighbors different?
      b. Do you think the neighborhood/community are closer enough here (SK)? Could be closer together? How?

6. Work life in SK **(SK-focused)**

(1) What was your very first part-time job in SK (or, what kind of part-time job you want to find)? How old where you when you started to work? Can you remember how much you earned? Do you remember what you were excited to spend your hard-earned money on?
(2) How did they cope during the depression here?
(3) What kind of work are you doing/studying now?
(4) Do you have any plans after this internship/high school graduation? What would you like to do?
(5) Have you ever thought about what you'd like to do in the future? What kinds of things would you like to do that you've never done?
(6) Where do you see yourself in twenty years? Do you have a dream? What is it?

7. Family meals and crafts in NK **(NK-focused)**
   (1) What was it like in your family What kinds of things do you remember eating in NK?
   (2) A lot of people remember their mom/dad making special foods? What do you remember about the foods your mom/dad used to make in NK?
   (3) What did you mother/father, grandmother/grandfather like to eat? Do you like cooking? Baking? What kinds of things do you like to bake/cook in NK?
   (4) Can you tell me how to make NK traditional foods such as /apai sundae, Pyongyang naengmyeon, or tteokbokki, soybean soup and so on/?
   (5) Is food different from NK and SK? (If so, how are they different?)

8. School days in NK
   (1) Did you go to one of the schools in this neighborhood in NK? How far is it from your house? How did you get to school?
   (2) What was the school like in NK? Was it a gender mixed school or a single gender school? How many students used to go? What subjects did you take? What was your favorite subject? Least favorite subject? Why?
   (3) How did NK students keep the school warm in the winter?
   (4) Do you remember going to school on cold mornings? Did they ever close the school for a /pokseol/? What did you do?
   (5) What were teachers like when you were at NK school? Were they very strict? Were the teachers then better than the teachers today?
   (6) Did you have lots of homework? In what subjects?
   (7) Were there illchin/gangs in your school? What are the different cliques called and who would be in them? e.g. illchin, zzang, ccintta, etc
   (8) How can you tell if someone's in an illchin/zzang/ccintta?
   - **School days in SK (SK-focused and compare NK-SK)**
   (9) How are NK-SK schools different? How was your school life in SK? Did you like schools in SK more? Why or why not?
   (10) How were your teachers in SK? Are they different from NK teachers?
   (11) How were your exams (Korean SATs and college interview) in SK? And how was process for applying universities in SK?
   (12) Can you compare NK kids and SK kids?

9. Games (NK-focused)

(1) Going back to the time when you were a kid, ten, what were some of the games you used to play in NK?
(2) What did you do after school to keep yourself occupied in NK?
(3) Did you play any games like gomujulnori, ttangttameokki, talchul, ureumttaeng in NK? How do you play that here? What are the rules? Was there a rhyme you used to sing for gomujulnori?
(4) Are there any games you used to play at night?
(5) Did boys and girls play different types of games in NK?
(6) How about adults, did they ever play any games in NK? e.g. go-stop, hwatu
(7) Do you have a favorite toy in NK? Who gave it to you? What was the occasion?

10. Travel (SK-focused)

(1) Have you had the opportunity to travel in SK? Where did you go? How long? Anything interesting happen?
(2) Has a communication barrier created any funny moments in any of your travels? Did you ever lose your luggage? Miss a plane? Get stranded?
(3) Where would you like to go that you've never been? Why?
(4) What's the funniest/scariest thing that ever happened to you when you were travelling?

11. Traditions (NK-focused)

(1) What kinds of traditions can you remember growing up with in your family in NK? Do you (plan to) keep these traditions alive with your own family?
(2) How did you celebrate Dano, Chuseok, Seolnal, Buddha's birthday? What did you wear? What kind of food did you make?
(3) What's your favorite memory of Myongcheol in NK?

12. Personal relationship (SK-focused)

(1) Who do you usually hang out with? Where/when/how did you meet them? Where do you hang out? What do you do with your friends?
(2) Do you ever stay overnight at your friend's place? What do you do? Do you play board games/cards/drinking games?
(3) Do you ever have parties with them? What kind of music do they play at the party? What do girls wear to clubs like that? Guys?

13. Immigration/Cultures (SK-focused)

(1) How was the immigration process?
(2) What has it been like for you in South Korea? What has your experience been like adapting to the South Korean way of life?
(3) Could you narrate an incident that shocked you (or that you will never forget) from your life in South Korea/ when you arrive in South Korea?
(4) For previous defectors (Have you kept the North Korean culture? / Do you have any North Korean cultures or traditions you want to keep (such as food cultures, traditions, and North Korean etiquettes in SK?)

(5) Did you have then more or less relations than you have now? With the North Korean community? the Hana center community?

14. Language (Compare NK-SK)

(1) Have noticed any interesting things about the way people speak North/South Korean around here?
(2) A lot of people think that Korean has changed a lot/is changing a lot, do you think so? Have you noticed any changes in the way people talk and sound around here?
(3) Can you tell by the way people talk around here that they come from here? Do people in NK/SK neighborhood sound different?
(4) Do you speak the same way as your friends? What kinds of differences to you notice? Has anyone ever told you, you sound different? Why?
(5) Have you ever tried to change the way you talk? Why? What did you do?
(6) Has anyone ever given you a hard time about the way you talk? What did they say? What did you think about that? What did you do about it?
(7) Do you think that how you sound plays a role in how others perceive you? Do you think that you try to change how you sound when you are in certain environments? Which ones? Why?

B. APPENDIX: Interview questions for SK participants

1. Very common opening questions for both genders **(General)**
   (1) Wow, your skin/makeup/fashion/earing and so on is so beautiful. Where did you buy that? What is your tip for skincare? I fall behind of all the Korean stuffs because I live in the U.S. Please recommend me some.
   (2) What kind of fashion style do you like? (hipster/feminine/dandy…)
   (3) Where do you usually go for hair treatment? Where did you get your hair style?
   (4) What kind of delicious food did you try/eat recently? Where/why/who did you go? I missed Korean foods a lot. Could you recommend me some?
   (5) How do you find good restaurants? (internet/friend/community and so on)

2. Demographics **(General)**
   (1) Let's see, your name is…
   (2) And your hometown is…
   (3) How many years of school did you get a chance to finish?
   (4) What types of work have you done when you left school?
   - How long did you do that?
   - And, what did you do (specifically) in the working place?

3. Hobby **(General)**
   (1) What do you usually do in your free time?
   (2) Do you like going to cute cafes? Where do you usually enjoy drinking coffee or eating deserts? What kinds of menu do you usually order and why? And who do you go there with?
   (3) Do you enjoy watching sports? What sports team do you like? And where do you usually watch games?
   (4) Have you watched any drama or movie recently? How was it?
   (5) What is your favorite movie? Would you recommend it to others?
   (6) What kind of music do you like? What kind of music are you listening to these days? Have you ever been to a concert to see one of your favorite groups? How was it?
   (7) What's the best concert you were ever at? Who's your favorite artist? How come?
   (8) Do you/have you done any volunteer work?
   (9) Do you play any musical instruments? If yes, which ones? For how long? What made you start? e.g. school, parents If no, is there an instrument you would like to learn to play? Why?

4. Dating practice
   (1) Do you currently have boyfriend/girlfriend Where/how did you meet her/him? If not, what kind of style do you like to meet?
   (2) When you have a date, where do you usually go/what do you usually do with her/him?
   (3) When did you (or your friends) start dating? How did your parents react? How long did you date? Do you think NK people start dating earlier or later than SK people?

(4) Did you ever have a boyfriend/girlfriend that your parents/friends didn't like? What kind of effort did you do to convince your parents?
(5) Do you think there's such a thing as a "generation gap"?

5. Neighborhood
   (1) Where do you live?
   (2) Is there any neighborhood place where people get together? Where they can go for a cold drink or tea/coffee in the afternoon? Evening? Is there a local pub/bar that you go to a lot?
   (3) What do you like best about your neighborhood? What are the things that make you feel good/bad about your neighborhood?

6. Work life
   (1) What was your very first part-time job (or, what kind of part-time job you want to find)? How old where you when you started to work? Can you remember how much you earned? Do you remember what you were excited to spend your hard-earned money on?
   (2) What kind of work are you doing/studying now?
   (3) Do you have any plans after this internship/ graduation? What would you like to do?
   (4) Have you ever thought about what you'd like to do in the future? What kinds of things would you like to do that you've never done?
   (5) Where do you see yourself in twenty years? Do you have a dream? What is it?

7. Family meals and crafts
   (1) What did you mother/father, grandmother/grandfather like to eat? Do you like cooking? Baking? What kinds of things do you like to bake/cook in NK?
   (2) What do you like to eat when you eat out with your family or in family gathering?

8. School days
   (1) Did you go to one of the schools in this neighborhood? How far is it from your house? How did you get to school?
   (2) What was the school like? Was it a gender mixed school or a single gender school? How many students used to go? What subjects did you take? What was your favorite subject? Least favorite subject? Why?
   (3) What were teachers like when you were at NK school? Were they very strict? Were the teachers then better than the teachers today?
   (3) Were there illchin/gangs in your school? What are the different cliques called and who would be in them? e.g. illchin, zzang, ccintta, etc
   (4) How can you tell if someone's in an illchin/zzang/ccintta?

9. Games
   (1) Going back to the time when you were a kid, ten, what were some of the games you used to play?
   (2) What did you do after school to keep yourself occupied ?

(3) Did you play any games like gomujulnori, ttangttameokki, talchul, ureumttaeng in NK? How do you play that here? What are the rules? Was there a rhyme you used to sing for gomujulnori?
(4) Are there any games you used to play at night?
(5) Did boys and girls play different types of games?

10. Travel

(1) Have you had the opportunity to travel? Where did you go? How long? Anything interesting happen?
(2) Where would you like to go that you've never been? Why?
(3) What's the funniest/scariest thing that ever happened to you when you were travelling?

11. Traditions

(1) What's your favorite memory of Myongcheol in NK?

12. Personal relationship

(1) Who do you usually hang out with? Where/when/how did you meet them? Where do you hang out? What do you do with your friends?
(2) Do you ever stay overnight at your friend's place? What do you do? Do you play board games/cards/drinking games?
(3) Do you ever have parties with them? What kind of music do they play at the party? What do girls wear to clubs like that? Guys?

13. Language

(1) Have noticed any interesting things about the way people speak North/South Korean around here?
(2) A lot of people think that Korean has changed a lot/is changing a lot, do you think so? Have you noticed any changes in the way people talk and sound around here?
(3) Can you tell by the way people talk around here that they come from here? Do people in NK/SK neighborhood sound different?
(4) Do you speak the same way as your friends? What kinds of differences to you notice? Has anyone ever told you, you sound different? Why?
(5) Have you ever tried to change the way you talk? Why? What did you do?
(6) Has anyone ever given you a hard time about the way you talk? What did they say? What did you think about that? What did you do about it?
(7) Do you think that how you sound plays a role in how others perceive you? Do you think that you try to change how you sound when you are in certain environments? Which ones? Why?

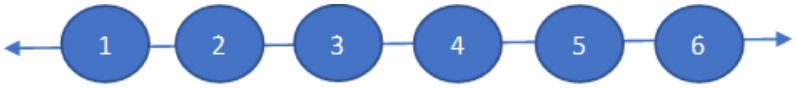
C. **APPENDIX:** Language attitude survey

Section 1: Language

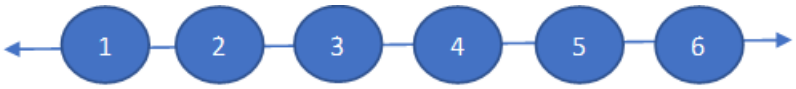
1. Language attitudes toward NK (6 Likert scale)

- Sounding smart

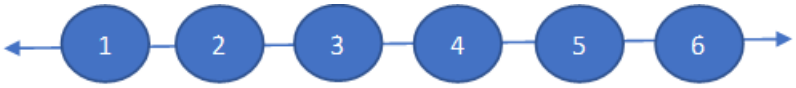
- Sounding polite



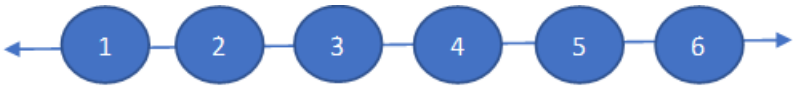
- Sounding friendly



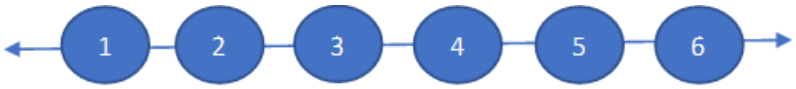
- Sounding normal



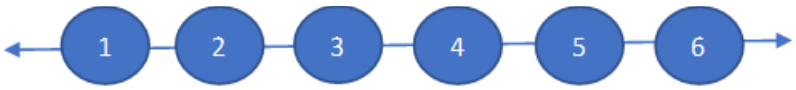
- Sounding snobbish



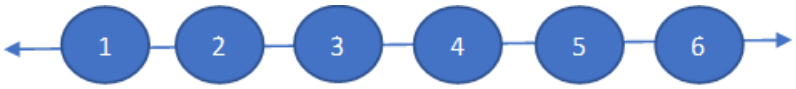
- Sounding feminine



- Sounding trustable

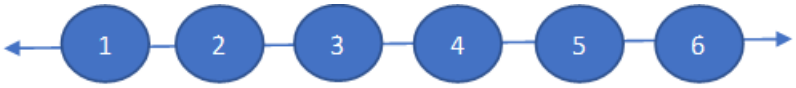


- Sounding correct

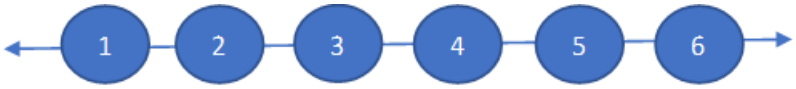


2. Language attitudes toward SK (6 Likert scale)

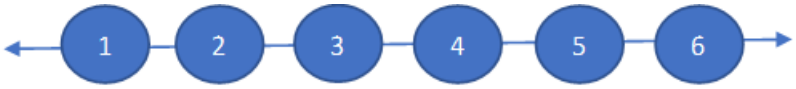
- Sounding smart



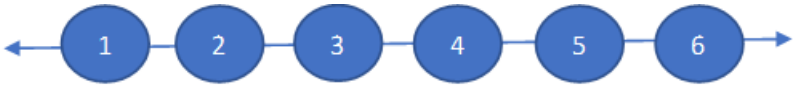
- Sounding polite



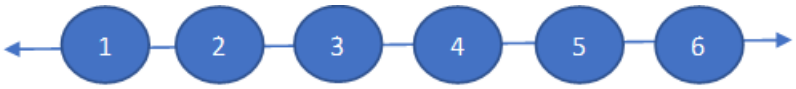
- Sounding friendly



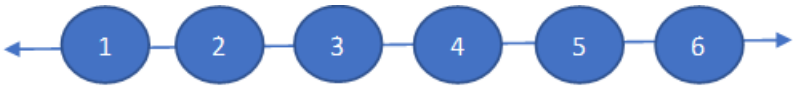
- Sounding normal



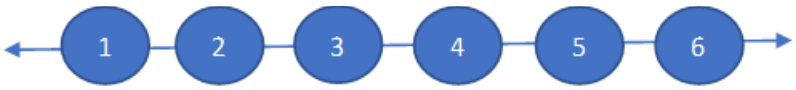
- Sounding snobbish



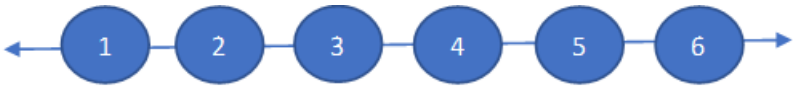
- Sounding feminine



- Sounding trustable

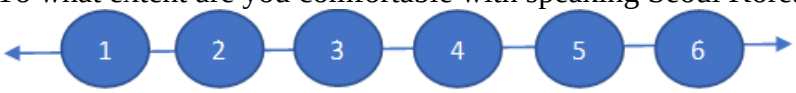


- Sounding correct



Section 2: Identity

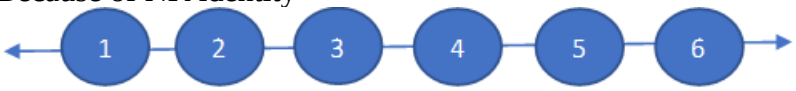
To what extent are you comfortable with speaking Seoul Korean?



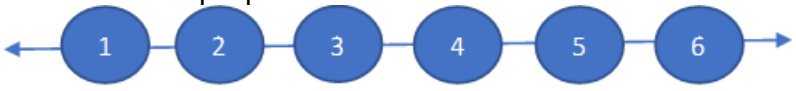
To what extent are you comfortable with speaking NK?

What does make you to keep using NK dialect?

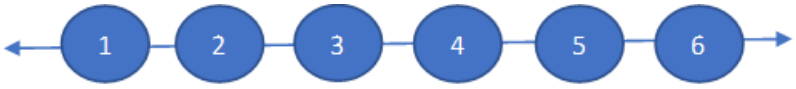
Because of NK identity



Because of NK people I interact with



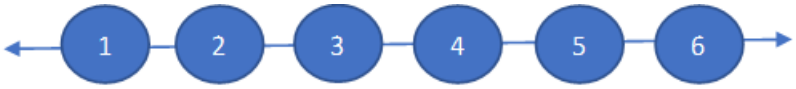
Because NK sounds better/cool



(open-ended): Write down if there’re any other reasons.

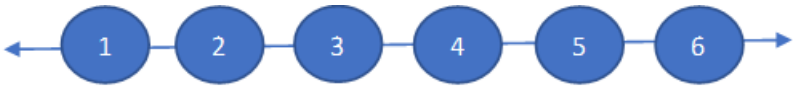
What make you using Seoul Korean instead of NK dialect?

Because of SK identity



Because of SK people I interact with

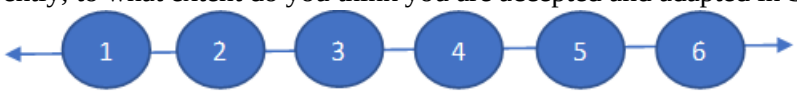
Because SK sounds better/cool



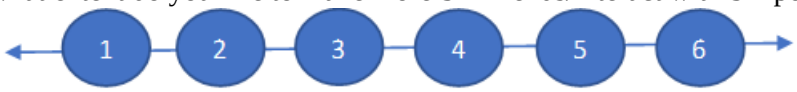
(open-ended): Write down if there're any other reasons.

Section 3: Willingness to assimilation

1. Currently, to what extent do you think you are accepted and adapted in SK community?



2. To what extent do you like to make more SK friends/interact with SK people?



3. To what extent do you like to acquire Seoul Korean language?

4. Why would like to learn/or would not like to learn Seoul Korean and stop using NK? (Open-ended question)
5. Why would like to make/or would not want to make more SK friends? (Open-ended question)
6. What is the biggest benefit of using NK? (open-ended question)
7. What is the biggest benefit of using SK? (open-ended question)
8. What is the biggest obstacle of using NK? (open-ended question)
9. What is the biggest obstacle of using NK?

Section 4: Regular interaction with SK

1. How do you often interact with SK people?

1) Less than 1 in a month
2) Once a month
3) Once in 15 days
4) Once a week
5) 2-3 times a week
6) 5 times a week

2. What is your purpose/main goal of meeting SK? (open-ended question)

REFERENCED CITED

Ahn, H. (1999). *Post-release phonatory processes in English and Korean: Acoustic correlates and implications for Korean phonology*. The University of Texas at Austin.

Ahn, M. A. (2007). An Acoustic Study of the Pitch Pattern in the Sentence Ending of the Choseonjok's Pyungbook Dialect in the China, Culture and Convergence *29*, 2007.5, 1-18 (In Korean).

Anastassiadis. T., Ralli, A., Gekas, S., Pappas, P., Siotou, A., Tsolakidis, S., Karachaliou, R., Rsimpouris. C., & Papanagiotou, C. (2017) Immigration and Language in Canada: Greeks and Greek-Canadians Questionnaire "The questionnaire created and used for the interviews which are part of the Immigrec Database"

Baayen, Harald & Davidson, Douglas & Bates, Douglas. (2008). Mixed-effects modeling with crossed random effects for subjects and items. Journal of Memory and Language. 59. 390-412. 10.1016/j.jml.2007.12.005.

Babel, M. (2010). Dialect divergence and convergence in New Zealand English. *Language in Society*, 437-456.

Bang, H. Y., Sonderegger, M., Kang, Y., Clayards, M., & Yoon, T. J. (2018). The emergence, progress, and impact of sound change in progress in Seoul Korean: Implications for mechanisms of tonogenesis. *Journal of Phonetics*, *66*, 120-144.

Bates D, Mächler M, Bolker B, Walker S (2015). "Fitting Linear Mixed-Effects Models Using lme4." *Journal of Statistical Software*, **67**(1), 1–48. doi: 10.18637/jss.v067.i01.

Bell, A. (1984). Language style as audience design. *Language in society*, *13*(2), 145-204.

Berthele, R. (2002). Learning a second dialect: A model of idiolectal dissonance.

Bortoni-Ricardo, S. M. (1985). The urbanization of rural dialect speakers. A sociolinguistic study in Brazil. *Cambridge Studies in Linguistics London*, 1-265.

Bourdieu, P. (1977). The economics of linguistic exchanges. *Social science information*, *16*(6), 645-668.

Carmichael, K. (2017). Displacement and local linguistic practices: R-lessness in post-Katrina Greater New Orleans. *Journal of Sociolinguistics*, *21*(5), 696-719.

Chae, S.-y. (1999). The core-periphery structure in the Korean lexicon reflected in a phonological variation and change. *Studies in Phonetics, Phonology and Morphology*, 5, 217-236.

Chambers, J. K. (1992). Dialect acquisition. *Language*, *68*(4), 673-705.

Chambers, J. K. (2009). Cognition and the linguistic continuum from vernacular to standard. *Vernacular Universals and Language Contacts: Evidence from Varieties of English and Beyond*, 19-32.

Cho, J-A. (2010). Learning Experiences and Reformation of Identity of North Korean Refugees. *Study of Unification policies*, *19*(2), 175-212 (in Korean).

Cho, J-A. (2014). Boundary Experiences and Identity of North Korean Refugee Teenagers. *Modern North Korean Study*, *17*(1), 101-155 (in Korean).

Cho, T., Jun, S. A., & Ladefoged, P. (2002). Acoustic and aerodynamic correlates of Korean stops and fricatives. *Journal of phonetics*, *30*(2), 193-228.

Choi, J. (2006). Interpreting neologisms used in Korea's rapidly changing society: Delivering the meaning of neologisms in simultaneous interpretation. *Meta: journal des traducteurs/Meta: Translators' Journal*, *51*(2), 188-201.

Choi, J. Y. (2009, July 10). *Becoming a South Korean*. No Cut News. Retrieved May 16, 2022, from https://www.nocutnews.co.kr/news/607313

Cumings, Bruce. *The Korean war: A history*. Modern Library, 2010.

Eckert, P. (2006). Communities of practice. *Encyclopedia of language and linguistics*, *2*(2006), 683-685.

Eychenne, J., & Jang, T. Y. (2015). On the merger of Korean mid front vowels: Phonetic and phonological evidence. *말소리와 음성과학*, *7*(2), 119-129.

Foreman, A. (2003). *Pretending to be someone you're not: a study of second dialect acquisition in Australia* (Doctoral dissertation, Monash University).

Fridland, V., Bartlett, K., & Kreuz, R. (2005). Making sense of variation: Pleasantness and education ratings of Southern vowel variants. *American Speech*, *80*(4), 366-387.

Gafter, R. J. (2016). What's a stigmatized variant doing in the word list? Authenticity in reading styles and Hebrew pharyngeals. *Journal of Sociolinguistics*, *20*(1), 31-58.

Giles, H. (ed.) (1980). Accommodation theory: Some new directions. York Papers in Linguistics 9:105- 36.

Giles, H. (Ed.). (2016). *Communication accommodation theory: Negotiating personal relationships and social identities across contexts*. Cambridge University Press.

Giles, H., & Powesland, P. F. (1975). *Speech style and social evaluation*. Academic Press.

Giles, H., Taylor, D. M., & Bourhis, R. Y. (1973). Towards a theory of interpersonal accommodation through speech: Some Canadian data. *Language in society*, 2, 177–192.

Grieser, J. A. (2019). Investigating topic-based style shifting in the classic sociolinguistic interview. *American Speech*, *94*(1), 54-71.

Han, J. I., & Kang, H. (2013). Cross-generational Change of/o/and/u/in Seoul Korean I: Proximity in Vowel Space. *Phonetics and Speech Sciences*, *5*(2), 25-31.

Han, M. S., and Weitzman, R. S. (1970). 4 Acoustic features of Korean /P, T, K/, /p, t, k/ and /ph, th, kh/ ', Phonetica, 22, 112-2

Holliday, J. J. (2015). A longitudinal study of the second language acquisition of a three-way stop contrast. *Journal of Phonetics*, *50*, 1-14.

Hübscher, I. C., Garufi, M., & Prieto, P. (2018). Preschoolers use prosodic mitigation strategies to encode polite stance.

Hübscher, I., Borràs-Comes, J., & Prieto, P. (2017). Prosodic mitigation characterizes Catalan formal speech: The Frequency Code reassessed. *Journal of Phonetics*, *65*, 145-159.

Idemaru, K., & Guion, S. G. (2008). Acoustic covariants of length contrast in Japanese stops. *Journal of the International Phonetic Association*, *38*(2), 167-186.

Idemaru, K., Winter, B., & Brown, L. (2019). Cross-cultural multimodal politeness: The phonetics of Japanese deferential speech in comparison to Korean. *Intercultural Pragmatics*, *16*(5), 517-555.

Idemaru, K., Winter, B., & Brown, L. (2019). Cross-cultural multimodal politeness: The phonetics of Japanese deferential speech in comparison to Korean. *Intercultural Pragmatics*, *16*(5), 517-555.

Irvine, J. T., Gal, S., & Kroskrity, P. V. (2009). Language ideology and linguistic differentiation. *Linguistic anthropology: A reader*, *1*, 402-434.

Ivars, A. M. (1994). Bidialectalism and identity. *The sociolinguistics of urbanization: The case of the Nordic countries*, 203-222.

Jang (2017). Study of VOT in stops in early 20th:'Based on Joseon language reading. *Korean linguistics*, *77*, 311-329. (in Korean).

Jang, H. & Shin, J. (2006). An acoustic study on the generational difference of the monophthongs in the Daegu Dialect. *Malsori,* 57, 15-30.

Jang, H. J. (2012). Perceptual cues of Korean affricates. *Korea University PhD. Dissertation* (in Korean).

Johnson, D. E., & Nycz, J. (2015). Partial mergers and near-distinctions: Stylistic layering in dialect acquisition. *University of Pennsylvania Working Papers in Linguistics*, *21*(2), 13.

Jung, B-J. (2006). Evaluation of the U.S.A. regarding assassination of Kim Gu via data in the U.S.A. *History & Reality,* (61), 313-346 (in Korean).

Kang, H. (1996). English loanwords in Korean. *Studies in Phonetics, Phonology, and Morphology*, 2, 21-47.

Kang, J. W. (2017). Unification of North and South Korean language, *Study of education and culture*, *23*(2), 345-364 (in Korean).

Kang, K. H. (2010). Generational differences in the perception of Korean stops. *Phonetics and Speech Sciences*, *2*(3), 3-10.

Kang, K. H., & Guion, S. (2009). Sound change and perceptual weight of acoustic correlates to Korean stops. *The Journal of the Acoustical Society of America*, *125*(4), 2568-2568.

Kang, K. H., & Guion, S. G. (2006). Phonological systems in bilinguals: Age of learning effects on the stop consonant systems of Korean-English bilinguals. *The Journal of the Acoustical Society of America*, *119*(3), 1672-1683.

Kang, K. H., & Guion, S. G. (2008). Clear speech production of Korean stops: Changing phonetic targets and enhancement strategies. *The Journal of the Acoustical Society of America, 124*(6), 3909-3917.

Kang, S. K (1996). Vowel analyses of North and South Korean. Linguistic studies (lSSN 0254-4474) 32 1 (1996. 3), 1-18 (in Korean).

Kang, S. K. (1997). Vowel system of Hamkyong dialect. *Linguistic study*.

Kang, S. K. (1999a). Merger in North Korean back vowels. *Phonetic Science, 5*(2), 41-55 (in Korean).

Kang, S. K. (1999b). Hypercorrection in North Korean /u/ and /ɯ/. *Phonetic Science, 6*(1), 43-54 (in Korean).

Kang, Y. (2003). Perceptual similarity in loanword adaptation:English postvocalic word-final stops in Korean. *Phonology*, 20, 219-273.

Kang, Y. (2014). Voice Onset Time merger and development of tonal contrast in Seoul Korean stops: A corpus study. *Journal of Phonetics*, *45*, 76-90.

Kang, Yoonjung & Suyeon Yun. 2018. "Acquisition of second dialect features by North Koreans in Seoul." *LabPhon16*, University of Lisbon, Lisbon, Portugal.

Kaplan, R. B., & Baldauf Jr, R. B. (2011). North Korea's language revision and some unforeseen consequences. *Handbook of language and ethnic identity*, 153-167.

Kenstowicz, M., & Park, C. (2006). Laryngeal features and tone in Kyungsang Korean: A phonetic study. *Studies in Phonetics, phonology and Morphology*, *12*(2), 247-264.

Kerswill, P. (1994). *Dialects converging: Rural speech in urban Norway*. Oxford University Press on Demand.

Kim, B-G. (2015), Current studies and suggestion for the future research regarding North Korean dialect: Focusing on before and after studies in 2000. *Linguistics and Literature, 130*, 1-25 (in Korean).

Kim, C. W. (1965). On the autonomy of the tensity feature in stop classification (with special reference to Korean stops). *Word*, *21*(3), 339-359.

Kim, H-G. (2009). Phonetic study of Yanbian Choseoncok dialect. *Speech Sound and Science, 1*(1), 47-52 (in Korean).

Kim, H-K. (2013). Research of North Korean Refugee Orphans. *Study for future teenagers, 10*(2), 69-101 (in Korean).

Kim, J. U., & Jang, D. J. (2007). Aliens among brothers? The status and perception of North Korean refugees in South Korea. *Asian Perspective*, 5-22.

Kim, M. (2004). Correlation between VOT and F0 in the perception of Korean stops and affricates. In *Eighth International Conference on Spoken Language Processing*.

Kim, M. R. C. (1994). *Acoustic characteristics of Korean stops and perception of English stop consonants*. University of Wisconsin--Madison.

Kim, S-J. (2013). Prospects of North Korean economy. *Economics of Unification, 2013*(2), 18-25.

King, S., Ren, Y., Idemaru, K., & Sturtzsreetharan, C. (2022). Sounding like a father: The influence of regional dialect on perceptions of masculinity and fatherhood. *Language in Society*, *51*(2), 285-308.

Korean Language Association. 1933. A Proposition for Unified Hankul Spelling Conventions. Seoul: Cosen.e.Hak.hoy (In Korean).

Labov, W. (1966). The effect of social mobility on linguistic behavior. *Sociological Inquiry*, *36*(2), 186-203.

Labov, W. (1971). The notion of 'system'in creole studies. *Pidginization and creolization of languages*, *447*, 472.

Labov, W. (1972). *Language in the inner city: Studies in the Black English vernacular* (No. 3). University of Pennsylvania Press.

Labov, W. (1981). Field methods of the project on linguistic change and variation.

Labov, W. (1990). The intersection of sex and social class in the course of linguistic change. *Language variation and change*, *2*(2), 205-254.

Labov, W. (2006). *The social stratification of English in New York city*. Cambridge University Press.

Ladegaard, H. J. (2000). Language attitudes and sociolinguistic behaviour: Exploring attitude-behaviour relations in language. *Journal of sociolinguistics*, *4*(2), 214-233.

Lambert, W. E. (1967). A social psychology of bilingualism. *Journal of social issues*, *23*(2), 91-109.

Lambert, W. E., Hodgson, R. C., Gardner, R. C., & Fillenbaum, S. (1960). Evaluational reactions to spoken languages. *The Journal of Abnormal and Social Psychology*, *60*(1), 44.

Lee, H. B (1991). Phonetic study in North Korea. *Hangeul*, (213), 7-28 (in Korean).

Lee, H. B. (1990). Differences in language use between North and South Korea. *International journal of the sociology of language*, *1990*(82), 71-86.

Lee, H-J. (2011). Violation of human right, investigating romantic relationship of North Korean female refugees: Focusing on their escape journey from North Korea and their settlement. *Peace Study*, *19*(2), 367-404 (in Korean).

Lee, H-Y. (2010). Protest for acceptance and Participant of new citizen: Case Study of Identity Formation of North Korean Refugees. *Korean Sociology, 44*(1), 207-241 (in Korean).

Lee, I. S, & Ko, S. H. (2016). *Introduction to Korean linguistics.* Han'guk Pangsong T'ongsin Taehakkyo Ch'ulp'an Munhwawŏn.

Lee, I., & Ramsey, S. R. (2000). *The Korean Language*. Suny Press.

Lee, K. (2001). Analyses of North Korean teenager maladjustments in South Korea. *Institute of Korean adolescence study*, 1-148 (in Korean).

Lee, K-S. (2005). Study of Adaptation and Settlement of North Korean refugees (in Korean).

Levon, E. (2014). Categories, stereotypes, and the linguistic perception of sexuality. *Language in Society*, *43*(5), 539-566.

Li, F. (2013). The effect of speakers' sex on voice onset time in Mandarin stops. *The Journal of the Acoustical Society of America*, *133*(2), EL142-EL147.National Institute of the Korean Language, 2008

Lisker, L. & Abramsom, A. S. (1964). A cross-language study of voicing in initial stops: acoustical measurements. *Word* 20, 384-422.

Love, J., & Walker, A. (2013). Football versus football: Effect of topic on/r/realization in American and English sports fans. *Language and Speech*, *56*(4), 443-460.

McKenzie, R. M. (2008). Social factors and non-native attitudes towards varieties of spoken English: a Japanese case study. *International journal of Applied linguistics*, *18*(1), 63-88.

Ministry of Patriots and Veterans Affairs. (2019, January 1). *Data of independent activists.* Ministry of Patriots and Veterans Affairs. Retrieved May 16, 2022, from http://www.mpva.go.kr/mpva//selectBbsNttList.do?bbsNo=82

Ministry of Unification, 2002. Linguistic divergence between North and South Korean. Seoul (In Korean).

Ministry of Unification. (2015, October 12). *Supports for North Korean refugees (Hana Institute)*. Ministry of Unification. Retrieved May 16, 2022, from https://www.unikorea.go.kr/unikorea/business/NKDefectorsPolicy/archive/?boardId=bbs_0000000000000012&mode=view&searchCondition=all&searchKeyword=&cntId=43745&category=&pageIdx=2

Morgan, J. M. (2015). A Diachronic Analysis of North and South Korean Monophthongs: Vowel Shifts on the Korean Peninsula.

Munro, M. J., Derwing, T. M., & Flege, J. E. (1999). Canadians in Alabama: A perceptual study of dialect acquisition in adults. *Journal of Phonetics*, *27*(4), 385-403.

Na, C-Y. (2007), Understanding Korean Grammar: Word, JNC (in Korean).

National Institute of Korean Language. (2011). Korean Standard Monophthongs (in Korean).

Nycz, J. (2011). *Second dialect acquisition: Implications for theories of phonological representation* (Doctoral dissertation, New York University).

Nycz, J. (2013). Changing words or changing rules? Second dialect acquisition and phonological representation. *Journal of Pragmatics*, *52*, 49-62.

Nycz, J. (2015). Second dialect acquisition: A sociophonetic perspective. *Language and Linguistics Compass*, *9*(11), 469-482.

Nycz, J. (2018). Stylistic variation among mobile speakers: Using old and new regional variables to construct complex place identity. *Language Variation and Change*, *30*(2), 175-202

Nycz, J. (2019, July). Linguistic and social factors favoring acquisition of contrast in a new dialect. In *Proceedings of the 19th International Congress of Phonetic Sciences, Melbourne, Australia 2019*.

Oh, E. (2011). Effects of speaker gender on voice onset time in Korean stops. *Journal of Phonetics*, *39*(1), 59-67.

Oh, E., Idemaru, K., & Kim, B. (2018). The use of a voice onset time cue in the perception of Seoul Korean stops as a function of listener gender. *언어*, *43*(4), 761-780.

Oh, M., & Yang, H. (2013). The production of stops by Seoul and Yanbian Korean speakers. *Phonetics and Speech Sciences*, *5*(4), 185-193.

Ohara, Y. (1999). Performing gender through voice pitch: A cross-cultural analysis of Japanese and American English. In *Wahrnehmung und Herstellung von Geschlecht* (pp. 105-116). VS Verlag für Sozialwissenschaften.

Omdal, H. (1994). From the valley to the city: Language modification and language attitudes. *The Sociolinguistics of urbanization: The case of the Nordic countries. Berlin: Walter de Gruyter*, 116-148.

Park, C., & Ahn, H., (2009). Relationship among PTSD, forgiveness, experiential avoidance of North Korean refugees. *Counselling Studies*, *10*(4), 1891-1905 (in Korean).

Park, K-R. (2005). Survey for socio-dialect study. *Dialect Study*, *2*, 171-213 (in Korean).

Park, K-R. (2005). Survey for socio-dialect study. *Dialect Study*, *2*, 171-213 (in Korean).

Park, Si-Kyun & Kwon, Byong-ro. (2003). Comparison between North and South Korean language: focusing on pronunciation and lexicons. *Korean Literature, 38*, 29-54. (In Korean).

Park, T-G. (2008). Korean War from Japan's perspectives. *International Area Studies, 17* (in Korean).

Payne, A. (1980). Factors controlling the acquisition of the Philadelphia dialect by out-of-state children. *Locating language in time and space*, *1*, 143-78.

Payne, A. C. (1976). *THE ACQUISITION OF THE PHONOLOGICAL SYSTEM OF A SECOND DIALECT*. University of Pennsylvania.

Perkins, J., & Lee, S. J. (2010). Korean affricates and consonant-tone interaction. In *Proceedings of the 6th workshop on Altaic formal linguistics. MIT Working Paper of Linguistics* (pp. 277-286).

Pharao, N., Maegaard, M., Møller, J. S., & Kristiansen, T. (2014). Indexical meanings of [s+] among Copenhagen youth: Social perception of a phonetic variant in different prosodic contexts. *Language in Society*, *43*(1), 1-31.

Podesva, R. J., Reynolds, J., Callier, P., & Baptiste, J. (2015). Constraints on the social meaning of released/t: A production and perception study of US politicians. *Language Variation and Change*, *27*(1), 59-87.

Preston, D. R. (1999). A language attitude approach to the perception of regional variety. In *Handbook of perceptual dialectology*. John Benjamins.

Preston, D. R. (Ed.). (1999). *Handbook of perceptual dialectology* (Vol. 1). John Benjamins Publishing.

R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.R Core Team, 2020

Rickford, J. R., & McNair-Knox, F. (1994). Addressee-and topic-influenced style shift: A quantitative sociolinguistic study. *Sociolinguistic perspectives on register*, *235*, 276.

Rys, K. (2007). *Dialect as a second language: linguistic and non-linguistic factors in secondary dialect acquisition by children and adolescents* (Doctoral dissertation, Ghent University).

Schilling-Estes, N. (2002). 15 Investigating Stylistic Variation. *The handbook of language variation and change*, 375.

Schilling-Estes, N. (2008). Stylistic variation and the sociolinguistic interview: A reconsideration. *R. Monroy e A. Sánchez, Orgs*, *25*.

Seong, C.-J. (2004). An acoustic analysis on the Korean 8 monophthongs - with respect to the acoustic variables on the F1/F2 vowel space. *The Journal of the Acoustical Society of Korea*, 23(6). 454-461.

Shimizu, K. (1989). A cross-language study of voicing contrasts of stops. *音声科学研究 = Studia phonologica*, *23*, 1-12.

Shimizu, K. (1996). *A Cross-Language Study of Voicing Contrasts of Stop Consonants in Asian Languages.* Seibido Publishing Co. Tokyo, Japan.

Siegel, J. (2010). *Second dialect acquisition*. Cambridge University Press.

Silva, D. J. (1993). The phonetics and phonology of stop lenition in Korean.

Silva, David J. (2006a). Acoustic evidence for the emergence of tonal contrast in contemporary Korean. *Phonology*, 23, 287–308.

Silva, David J. (2006b). Variation in voice onset time for Korean stops: A case for recent sound change. *Korean Linguistics*, 13, 1–16.

Silverstein, M. (1979) "language structure and linguistic ideolory." In R. Clyne, W. Hanks & C. Hofbauer (eds.), The Elentents: A parasession on linguistic units and levels. Chicago: Chicago Linguistic Society, p.193-247

Sin, C. Y., Shin, J., Kiaer, J., & Cha, J. (2012). *The sounds of Korean*. Cambridge University Press.

Sohn, H. M. (2001). *The korean language*. Cambridge University Press.

Song, J. J. (2006). *The Korean language: Structure, use and context*. Routledge.

Song, J. J., Gottlieb, N., & Chen, P. (2001). North and South Korea: language policies of divergence and convergence. *Language planning and language policy: East Asian perspectives*, 129-157.

Stanford, J. (2007). *Dialect contact and identity: A case study of exogamous Sui clans* (Doctoral dissertation, Michigan State University).

Stanford, J. N. (2008). A sociotonetic analysis of Sui dialect contact. *Language Variation and Change*, *20*(3), 409-450.

Starks, D., & Bayard, D. (2002). Individual variation in the acquisition of postvocalic/r: Day care and sibling order as potential variables. *American Speech, 77*(2), 184-194.

Stuart-Smith, J., Pryce, G., Timmins, C., & Gunter, B. (2013). Television can also be a factor in language change: Evidence from an urban dialect. *Language*, 501-536.

Tagliamonte, S. A., & Molfenter, S. (2007). How'd you get that accent?: Acquiring a second dialect of the same language. *Language in society*, *36*(5), 649-675.

The Language Research Institute, Academy of Social Science. 1954. Cultured Language Policy. Pyongyang, Democratic People's Republic of Korea. (In Korean).

The Language Research Institute, Academy of Social Science. 1966. Language Policy. Pyongyang, Democratic People's Republic of Korea. (In Korean).

The Language Research Institute, Academy of Social Science. 1973. Policy of Cultured Language. Pyongyang, Democratic People's Republic of Korea. (In Korean).

The Language Research Institute, Academy of Social Science. 1976. Revised Language Policy. Pyongyang, Democratic People's Republic of Korea. (In Korean).

Trudgill, P. (1972). Sex, covert prestige and linguistic change in the urban British English of Norwich. *Language in society*, *1*(2), 179-195.

Trudgill, P. (1981). Linguistic accommodation: Sociolinguistic observations on a sociopsychological theory. *Papers from the Parasession on Language and Behavior*, 218-237.

Walker, A. (2014). *Crossing oceans with voices and ears: Second dialect acquisition and topic-based shifting in production and perception*. The Ohio State University.

Wells, J. C. (1973). *Jamaican pronunciation in London*. Blackwell.

Winter, B., & Grawunder, S. (2012). The phonetic profile of Korean formal and informal speech registers. *Journal of Phonetics*, *40*(6), 808-815.

Yeon, J. (2006). 'Standard language' and 'Cultured language'. *Korean Language in Culture and Society*, 31-43.

Yim, Y. S. (1979). Language reform as a political symbol in North Korea. *World Affs.*, *142*, 216.