CONSONANT CLUSTER SIMLPIFICATION IN KOREAN CODAS:

LANGUAGE –INTERNAL AND LANGUAGE-EXTERNAL

CONSTRAINTS INTERFACE WITH REFERENCE TO

OPTIMALITY THEORY

by

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<div align="right">May 2, 2005</div>

ABSTRACT

CONSONANT CLUSTER SIMLPIFICATION IN KOREAN CODAS: LANGUAGE –INTERNAL AND LANGUAGE-EXTERNAL CONSTRAINTS INTERFACE WITH REFERENCE TO OPTIMALITY THEORY

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In Korean, when a morpheme contains a coda cluster in its underlying form (such as /salm/ 'life,' /hulk/ 'soil'), we observe two outcomes in its surface representation. In cases when the morpheme followed by either another consonant or by a word boundary, the cluster is simplified by deleting one consonant. However, if a vowel-initial morpheme follows the underlying cluster, the second member of the cluster assumes the role of a syllable onset. Contrary to prescriptive accounts in which both the deleted consonant and the results of resyllabification are claimed to be

completely predictable, observation of contemporary Korean usage suggest that there is variation in terms of how cluster reduction and resyllabification are realized.

With respect to the phonological phenomena of morpheme-final consonant clusters in Korean, this study examines both theoretical and empirical aspects of the phenomena. As for the theoretical aspects, this study attempts to provide an explanation regarding the phonological properties of the surviving (or deleted) segment by employing Optimality Theory. In addition, by means of quantitive data analysis, this study investigates not only patterns of variation but also social factors governing the variation with relation to consonant cluster simplification in Korean.

By considering both theoretical and empirical aspect of the phenomena, this study pursues a more satisfactory explanation for consonant cluster simplification in Korean, and furthermore suggests Optimality Theory as a formal model for integrating these two aspects of this linguistic phenomenon.

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LIST OF ABBREVIATIONS

Past-Past tense

Dec. –Declarative

Nom- Nominative

CI- Citation

AM- Adjectival Marker

Com.- Complementary

Loc.- Locative

TC- Topic Marker

POL- Polite form

Acc.- Accusative

Poss- Possessive

Prog.- Progressive

CHAPTER 1

PRELIMINARIES

1.1 Introduction

The aim of this study is to present more satisfactory explanation for the phonological phenomena governing the realization of morpheme-final consonant clusters in Korean (e.g. /eps +ta/ → [ep-ta] 'not exist') by considering both theoretical and empirical perspectives. This study explores various phonological theories that can be invoked to provide explanations for two key processes: the cluster simplification and resyllabification. In particular, by employing several core concepts of Optimality Theory, not only the traditionally accepted (i.e., prescriptive) phonological properties of cluster simplification can be explained, but also the observed variability of the simplification phenomenon can be accounted for.

In addition to examining theoretical aspects of coda cluster simplification, this study reports the results of linguistic experiments to investigate whether there is any connection between nonlinguistic factors such as age, gender, educational level of a speaker, and the variability of the phenomenon. While most previous analyses have been done exclusively from either a theoretical linguistic perspective or an extralinguistic (usually dialectological) perspective, this study suggests that employing both linguistic and nonlinguistic factors is the most fruitful approach to analysis.

1.2 The issues

The surface structure of Korean allows four types of syllables: CV, CVC, V, VC (fortis and aspirated obstruents are considered as single consonants[1]). As these syllable structures indicate, consonant clusters are not allowed either in onset or coda positions. In underlying representations, however, there are cases of "CC" clusters in coda position. When a morpheme contains a coda cluster in its underlying form such as /salm/ 'life,' /talk/ 'chicken,' we observe two outcomes in its surface representation. In cases when the morpheme is followed by either another consonant or by a word boundary, the cluster is simplified by deleting one member of the cluster: /salm +to/ 'life also' → [sam-to], /kaps/ 'price' → [kap]. If, however, a vowel-initial morpheme follows the underlying cluster, the second member of the cluster assumes the role of a syllable onset. Hence, both members of the clusters are licensed by the language's syllable structure and thus both consonants surface: /salm+i/ 'life+ nominative marker' → [sal-mi], /eps+i/ 'not exist +adverbial marker' → [ep-si]. Contrary to prescriptive accounts in which both the deleted consonant and the results of resyllabification are claimed to be completely predictable, observations of contemporary Korean usage suggest that there is variation in terms of how cluster reduction and resyllabification are realized, as will be demonstrated in Chapter 4.

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[1] Although these segments are described as phonological clusters (Martin 1954), in much of the previous research (Kim-Renaud 1974, Ahn 1985, Silva 1992, and Lee 1997), fortis obstruents such as *kk, tt, ss* and aspirated obstruents such as *kh, th, ch, ph* are considered as single consonants. Thus, I have decided to treat the fortis and aspirated consonants as single consonants.

1.2.1 Consonant Cluster Simplification in Codas

There are 11 different kinds of morpheme-final clusters in Korean: /-ps/, /-ks/, /-ls/, /-nc/, /-lt^h/[2], /-nh/, /-lh/, /-lp/, /-lp^h/, /-lk/, and /-lm/. (See Appendix A for a word list of forms containing these clusters.) Lexical items containing these clusters are either monosyllabic nouns or stems of a predicate. As mentioned earlier, these morpheme-final cluster words show cluster simplification by deleting one of the sequence either before a word boundary or a consonant. Determining which consonants in the CC sequence should be deleted has traditionally been governed by prescriptive means: Korean sources such as *Kwuke emwun kyuceng cip* "Korean grammar" (2000) instruct speakers how to produce these forms by providing lists of the form "C$_1$ C$_2$ →C$_1$" or "C$_1$ C$_2$ → C$_2$".

(1) Monosyllabic nouns in isolation ((C)VCC/__#)

cluster types	underlying forms	prescriptively predicted forms	observed phonetic forms	
/-lk/	/talk/	[tak]	[tak]	'chicken'
	/hulk/	[huk]	[huk]	'soil'
/-lm/	/salm/	[sam]	[sam]	'life'
/-ls/	/tols/	[tol]	[tol]	'first birthday'
/-ks/	/neks/	[nek]	[nek]	'soul'
	/saks/	[sak]	[sak]	'wage'
/-ps/	/kaps/	[kap]	[kap]	'price'

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[2] This research mostly follows Yale Romanization in its presenting of Korean data (including Korean phoneme inventory). However, the aspirated consonants are presented as C^h (rather than Ch, which is the Yale Romanization), to emphasize the fact that they are single consonants.

| /-lp/ | /yeotelp/ | [yeotel] | [yeotel] | 'eight' |

(2) Monosyllabic nouns followed by a consonant ((C) VCC/__C)

cluster types	underlying forms	prescriptively predicted form	observed phonetic forms	
/-lk/	/talk+to /	[tak-to]	[tak-to]	'chicken also'
	/hulk+to/	[huk-to]	[huk-to]	'soil also'
/-lm/	/salm+ to/	[sam-to]	[sam-to]	'life also'
/-ls/	/tols+to/	[tol-to]	[tol-to]	'first birthday also'
/-ks/	/neks+to/	[nek-to]	[nek-to]	'soul also'
	/saks+to/	[sak-to]	[sak-to]	'wage also'
/-ps/	/kaps+to/	[kap-to]	[kap-to]	'price also'
/-lp/	/yeotelp+to/	[yeotel-to]	[yeotel-to]	'eight also'

The data presented in Examples (1) and (2) are the cases of monosyllabic nouns, each placed in the two linguistic environments: 1) in isolation and 2) followed by a C-initial particle, /-to/ 'also.' Here forms indicate only one consonant of the underlying clusters is realized as a final phonetic form. In this case, there is no difference between prescriptively correct forms and observed phonetic forms. Except for the cases of dialectal variations (the examples /talk/ and /hulk/ are pronounced as [tal] and [hul] respectively in the Gyeongsang dialect), the cluster simplification process in the monosyllabic nouns is categorical (Kim-Renaud 1974, Lee 1976, Chung 1980, Ahn 1985, Whitman 1985, Kim K.H 1987, Cho 1990, Oh 1994).

However, as for the morpheme-final cluster predicates, the situation is rather different: The prescriptively correct form is not the only phonetic outcome produced by native speakers. The observed phonetic forms lead to the claim that there is variation regarding cluster simplification in Korean (Park 1990, Hong 1991, Cho 1999).

(3) Predicate morphemes followed by a consonant

cluster types	underlying forms	prescriptively predicted forms	observed phonetic forms	
/-lk/	/palk-ta/	[pak-ta]	[pak-ta]~[palp-ta]	'bright'
	/nulk-ta/	[nuk-ta]	[nuk-ta]~[nulk-ta]	'old'
	/ilk-ta/	[ik-ta]	[il-ta]~[ilk-ta]	'read'
	/malk-ta/	[mak-ta]	[mal-ta]~[malk-ta]	'clear'
/-lp/	/palp-ta/	[pap-ta]	[pap-ta]~[palp-ta]	'tread'
	/nelp-ta/	[nel-ta]	[nep-ta]~[nelp-ta]	'wide'
	/yalp-ta/	[yal-ta]	[yal-ta]~[yalp-ta]	'thin'
	/ccalp-ta/	[ccal-ta]	[ccal-ta]~[ccalp-ta]	'short'
/-lp^h/	/ulp^h-ta/	[up-ta]	[ul-ta]~[ulp-ta]	'recite'
/-lt^h/	/halt^h-ta/	[hal-ta]	[hal-ta]~[halt-ta]	'lick'
	/hwult^h-ta/	[hwul-ta]	[hwul-ta]~[hwult-ta]	'hackle'

The data presented in (3) are the citation forms of the each predicate (stem of a predicate + /ta/ the citation suffix). They are categorized separately from the nouns

under consideration because of their difference in lexical category. In Korean, a predicate is composed of a stem and an inflectional suffix. Moreover, the stem of the predicate, including any morpheme-final consonant clusters, cannot be produced without an inflectional suffix: predicate stems are bound morphemes, and thus cannot appear in isolation. That is why, unlike monosyllabic nouns, the case of CVCC/__# is not considered in the predicates. In contrast, the nouns appearing in the "noun + suffix" constructions in (2) are free morphemes. Given this morphological distinction between the two lexical categories, it is thus assumed that the behavior of any consonant cluster in each situation could differ. As a matter of fact, the observed forms in (1), (2) and (3) support this assumption.

1.2.2 Resyllabification

When these morpheme-final clusters are followed by a vowel, the general pattern, including those described in prescriptive accounts, is to syllabify both of the consonants in the cluster: the first consonant is syllabified as the coda of the first syllable, and the second consonant is syllabified as the onset of the following syllable. While prescriptive grammar dictates that resyllabification is a categorical process (as is cluster simplification), the observed outcomes of resyllabification indicate that there is variation. The data presented in (4) and (5) are the same nouns and predicates as in (1), (2) and (3), except for the fact that they are now presented in the context where by each is followed by a vowel-initial morpheme.

(4) Monosyllabic nouns + /-i/ (nominative marker)

underlying forms	prescriptively predicted forms	observed phonetic forms	
/talk-i/	[tal-ki]	[ta-ki] ~ [tal-ki]	'chicken'
/hulk-i/	[hul-ki]	[hu-ki] ~ [hul-ki]	'soil'
/salm-i/	[sal-mi]	[sa-mi] ~ [sal-mi]	'life'
/tols-i/	[to-li]	[to-li]	'first birthday'
/neks-i/	[nek-si]	[ne-ki] ~ [nek-si]	'soul'
/saks-i/	[sak-si]	[sa-ki] ~ [sak-si]	'wage'
/kaps-i/	[kap-si]	[ka-pi] ~ [kap-si]	'price'
/yeotelp-i/	[yeotel-pi]	[yeote-li] ~ [yeotel-pi]	'eight'

(5) Predicates + /-un/ (past adnominal marker)

underlying forms	prescriptively predicted form	observed phonetic forms	
/palk-un/	[pal-kun]	[pal-kun]	'bright'
/nulk-un/	[nul-kun]	[nul-kun]	'old'
/ilk-un/	[il-kun]	[il-kun]	'read'
/malk-un/	[mal-kun]	[mal-kun]	'clear'
/palp-un/	[pal-pun]	[pal-pun]	'tread'
/nelp-un/	[nel-pun]	[nel-pun]	'wide'
/yalp-un/	[yal-pun]	[yal-pun]	'thin'

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/ccalp-un/	[ccal-pun]	[ccal-pun]	'short'
/ulp^h-un/	[ul-p^{h}un]	[ul-p^{h}un]	'recite'
/halt^h-un/	[hal-t^{h}un]	[hal-t^{h}un]	'lick'
/hwult^h-un/	[hwul-t^{h}un]	[hwul-t^{h}un]	'hackle'

In (4), except for the example /tols/, all of the observed nominal forms show variation. When the deviations from the prescriptively correct forms are reviewed, a pattern emerges: there is a deleted consonant. The deleted consonant can be the first consonant of the cluster as in /talk+i/→[ta-ki], /hulk+ i/ →[hu-ki], or it can be the second consonant of the cluster as in /neks+i/→[ne-ki], /saks+i/→[sa-ki]. Although the example /tols+i/ shows no variation, it is also the case that the second consonant of the cluster is deleted. Given that the examples presented in (4) conform to the Korean syllable template CVC-CV without any deletion, to delete one member of the sequences is unexpected.

In addition, another noticeable fact from the data (4) and (5) is that lexical category seems to matter. Only nouns show variation, while in the predicates, the resyllabification is predictable and categorical. Moreover, compared with the cluster simplification, this situation shows a directly opposite result. Based on the findings presented above, major questions concerning consonant cluster simplification can be summarized as thus:

1) How can we characterize the phonological features of the surviving (or deleted) segment, and how can those characterizations be elaborated into

phonological theory of Korean?

2) How does lexical category play a role with relation to the process of
consonant cluster simplification?

3) What factors (linguistic and /or extralinguistic) govern the observed
variation?

The later chapters of this dissertation are presented as follows: Chapter 2
provides an overview of previous accounts regarding consonant cluster simplification
and resyllabification in cluster codas in Korean. Various analyses and ideas for the
phonological phenomena are examined, from the earliest phonological-rule-based
approach to the recent constraint-based, optimality theoretical approach. The theoretical
background of this research is associated with those previous analyses.

In Chapter 3, the research questions of this study are represented in terms of
hypotheses. The hypotheses exploit linguistic and non-linguistic aspects of this research
based on the previous accounts, summarizes the methodology of this study. The
demographics of the subjects, linguistic materials, and procedures used in the
experiment are provided.

Chapter 4 is allocated for the results of the experiments. Based on the results,
detailed discussions regarding the suggested hypotheses are presented.

In Chapter 5, more theoretical issues are discussed. In particular, by employing
optimality-theoretic framework, the issues such as language variation and language
change in coda cluster simplification in Korean are contextualized into a formal model
of linguistic theory.

Finally, Chapter 6 summarizes the study and offers suggestions for future research.

CHAPTER 2

THEORETICAL BACKGROUND

2.1 Introduction

Cluster coda–related issues in Korean have been studied by many researchers: Kim-Renaud 1974, Lee 1976, Chung 1980, Whitman 1985, Ahn 1985, Kim J.M. 1986, Kim K.H. 1987, Park 1990, Hong 1991, Oh 1994, Iverson and Lee 1994, Cho 1999, Sohn 2002. The purpose of this chapter is to summarize previous studies and discuss their theoretical accounts of coda cluster simplification (CCS) in Korean. Some of the key findings of the previous studies are critically developed into the theoretical foundation of this research.

2.2 Linear Approaches

When the previous studies are overviewed, one finds that most of the earlier researchers have discussed the issue of CCS by positing a variety of phonological rules (Kim-Renaud 1974, Lee 1976, Chung 1980, Ahn 1985). Kim-Renaud (1974), for example, posits four different deletion rules, all of which operate prior to a syllable boundary (indicated by "$").

(6) Kim-Renaud 1974

    a. Post-noncontinuant C-deletion

      C→Ø / [-cont] ___$

    b. Pre-noncontinuant l-deletion (optional)

      l →Ø /___ [-cont] $

    c. Coronal deletion

      [+cor, -rel] →Ø / [+cor] ___$ ([rel] = unreleased)

    d. Post-l p deletion (optional)

      p→ Ø / l___$

In contrast, Chung (1980) proposes simpler rules that formulate CCS as two cases. In each case, the deleted segments are decided by coronality of the second segment of a sequence: as rule (a) describes, when the second segment of a sequence is coronal, it is deleted while as rule (b) describes, when the second segment is not coronal, the first segment is deleted.

(7) Chung 1980

    a. C   C → C Ø / _____$ (where "$" represents syllable boundary)
           [+cor] 1 2
      1   2

    b. C   C → Ø C / _____C $
           [-cor]   [-cor]
      1   2   1 2

Finally, Ahn's 1985 analysis takes a different point of view concerning the CCS from the previous studies in the sense that his rules are based on the concept of preference rather than deletion. In a sequence of [-cont, -cor] [+lateral], [+ lateral] is preferred (8a), and elsewhere, the first segment is preferred (8b).

(8) Ahn 1985

    a.   [-cont, -cor] > [+lateral]

    b. $C_1 > C_2$

Basically, the rules presented in (6) - (8) describe the phonological environments in which CCS occurs. They have looked at CCS with the aim of indicating which segment of the cluster is deleted in what phonological environment. As the phonological rules indicate, however, their attempts are limited to a description of the phenomenon rather than providing any sort of explanation about CCS. More crucially, since the research presented above assumes that the prescriptively correct form is the only possible outcome, the rules presented in (6) - (8) either have to struggle with contradictory rules[3] to capture variation or have to treat variation as exceptional cases.[4]

2.3 Non-linear Approaches

Other researchers (Whitman 1985, Kim K.H 1987, Cho 1990, Oh 1994) have considered Underspecification Theory (Archangeli 1984) as a core concept to account for CCS. In the theory of underspecification, phonological representation is claimed to

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[3] Rules b and d suggested by Kim-Renaud in (6), are too specific to be considered as "authentic" rules.
[4] The rules in (6) and (7) fail in capturing the cases of /lp/ →[l], /lk/→[l].

be minimal by eliminating redundancies from its feature representation, and the

unspecified features are reconstructed by redundancy rules. Based on underspecification

theory, Whitman (1985) approached CCS by exploiting the representation system of

Korean obstruents, arguing that /t/ is the most unmarked segment. According to him, in

coda position, all the coronal obstruents (/c/, /cʰ/, /tʰ /, /s/, /ss/) are neutralized as [t] and

non-coronal aspirated or tensed obstruents are neutralized as plain unreleased their

counterparts (e.g. /pʰ /→[p], /kk/ →[k]). Under this assumption, coronal obstruents such

as /c/ and /s/ are specified only by the feature [+cont], and [+ strid] respectively. As a

result, Coda Neutralization, which plays a crucial role in CCS, can be stated concisely as

follows:

(9) Continuant Coda Neutralization (Whitman 1985: 282)

Root

C

[+cont]
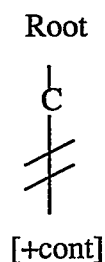
Since both Coda Neutralization and CCS are closely related to coda conditions of

Korean, the connection between Coda Neutralization and CCS seems to be a reasonable

departure point for examining CCS. Moreover, the fact that segments such as /s/, /c/,

/pʰ / and /tʰ/ resulting in neutralization in coda position are always deleted segments

during CCS supports the connection of the two. In addition to Coda Neutralization,

Whitman suggested a Coda Formation rule to deal with dialectal variation in CCS. The Coda Formation rule provided in (10) reflects a different preference of directionality in syllabification depending on dialects.

(10)   Coda Formation Rules (Whitman 1985: 287)

   a. Minimal Coda Formation (Gyeongsang)

      V   C
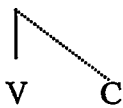
      (e.g. /hulk/ 'soil' → [hul])

   b. Maximal Coda Formation (Seoul)

      V (C) C
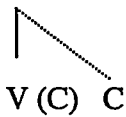
      (e.g. /hulk/ 'soil' → [huk])

In (10), (a) is explained as an instance of linking from left to right, while (b) is explained as an instance of linking right to left. The derivation of /kaps/ → [kap] in the Seoul dialect is provided in (11).

(11) a. σ
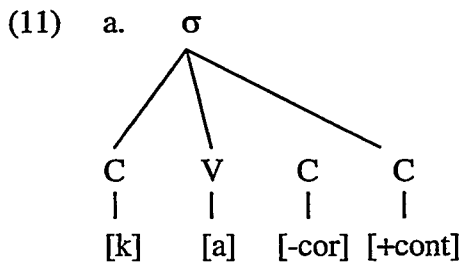
```
        σ
      / | \
     /  |  \
    C   V  C   C
    |   |  |   |
   [k] [a] [-cor] [+cont]
```
Output of syllabification
(Maximal coda formation)

b. σ
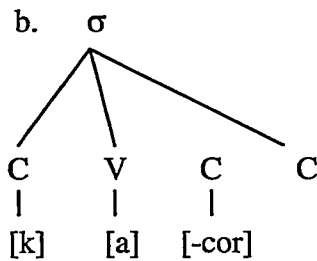
```
        σ
      / | \
     /  |  \
    C   V  C    C
    |   |  |
   [k] [a] [-cor]
```
Output of Continuant Coda Neutralization

c. σ
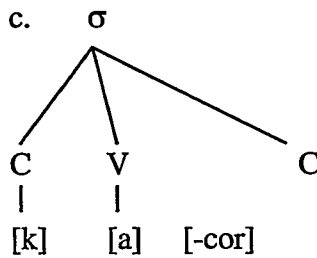
```
        σ
      / |  \
     /  |   \
    C   V    C
    |   |
   [k] [a]  [-cor]
```
Deletion of C by UC[5]

d. σ
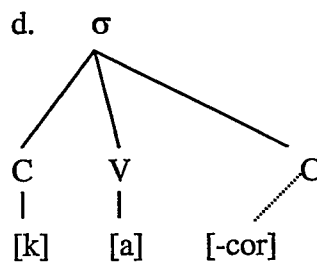
```
        σ
      / | \
     /  |  \
    C   V   C
    |   |  /
   [k] [a] [-cor]
```
Association of [-cor] by UAC

---

[5] Unassociation Convention: a) If a segment is deleted, delete its association lines, where "autosegment" refers to both anchors and autosegments in the conventional sense. b) Apply association conventions. c) Delete autosegments not associated with units on a higher tier, where "higher"=syllable structure representation> timing tier > other tiers (Whitman 1985:288).

Although Whitman's (1985) analysis seems to be on the right track in the sense that he discusses CCS in terms that look to extract phonological generalizations, there are a couple of weaknesses to be noted about his approach. One of the criticisms emerges during the derivation provided in (11). Concerning the first step syllabification in (11-a), one observes the fact that the continuant consonant specified with [+cont], that is, /s/, is syllabified as a coda in the first stage. At the next stage of syllabification (b), the feature [+cont] is deleted by coda neutralization. Since a consonant specified with the feature [+ cont] never occurs as a phonetic coda in Korean, the assumption that [+cont] would ever exist in the coda is unreasonable. Generally speaking, why should an unlicensed segment that never occurs in this position be considered as an underlying or intermediate form? Furthermore, there is always a possible coda candidate in the consonant clusters: Why would Korean speakers need to employ a two–step process such as deleting and then associating a segment rather than choosing the right segment from the outset? A final critical point is one of descriptive adequacy: Whitman fails to deal successfully with the case of /lm/ cluster. When the cluster is /lm/, in both dialects the output is [m]. However, his mechanism predicts two different forms, [m] for Seoul dialect speakers and [l] for Gyeongsang dialect speakers, which is not attested.

Oh's (1994) study basically goes in the same direction as Whitman's in the sense that she exploits Coda Neutralization and a syllable-based account from the perspective of Underspecification Theory. While her basic assumption for the feature representation of Korean obstruents is not different from Whitman's, instead of Coda Formation rules in syllabification, she proposed a condition called Phonetic Coda

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Licensing to account for CCS; while an underlying morpheme allows two final

consonants, the phonetic syllable coda allows only one consonant, either a sonorant or

an unreleased obstruent. Oh's analysis presented in (12) illustrates this account.

(12) Oh (1994: 166)

/kaps/ 'price' → [kap]
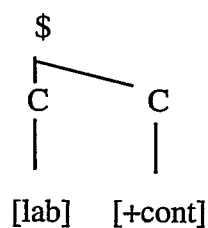
[lab] [+cont]	[lab] [+cont]	[lab]
Underlying syllabification	Neutralization	Phonetic syllabification coda condition

Regarding variation, she also considered only the dialectal variation in CCS. She

proposed that there is different priority for the phonetic coda condition between the two

dialects; standard speakers prefer the Place Licensing while Gyeongsang dialect

speakers prefer the Sonorant Licensing during phonetic syllabification. In (13), her

analysis of dialectal variation in /hulk/ 'soil' is provided.

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(13) Oh (1994:166)

a. /hulk/ 'soil' → [huk] (Standard)

    Underlying   Phonetic syllabification coda condition
    syllabification   puts a priority on the Place Licensing

b. /hulk/ 'soil' → [hul] (Gyeongsang)

    Underlying   Phonetic syllabification coda condition
    syllabification   puts a priority on the Sonorant Licensing

As the derivations in (13) indicate, the notion of Phonetic Coda Licensing and

the different priorities in the two dialects nicely capture not only the properties of codas

in Korean but also variation in CCS. However, as Iverson and Lee (1994) pointed out,

Oh's analysis based on "Korean-specific syllabic licensing of phonological features"

lacks generalization in terms of phonological theory. In other words, as for a

phonological fact of a language, rather than a language specific account, an explanation

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developed in terms of cross-linguistic generalization is what is to be pursued in phonological theories.

All the same, Oh's analysis is extremely important because it presents useful ideas such as 'licensing' and 'priority,' thereby suggesting a possibility for an Optimality Theoretic analysis, although she did not take this view in any technical sense. By taking advantage of Oh's (1994) analysis, this study pursues constraints-based approach in CCS. Her basic concepts of 'coda licensing' and 'priority' are further explored in terms of constraints.

2.4 Optimality-theoretic Approaches

Optimality-theoretic approaches (Iverson and Lee 1994, Cho 1999, Sohn 2002) to CCS assume two things: i) there is a set of language universal constraints (Universal Grammar), and ii) rankings of the constraints are language specific (language specific grammar). Under these assumptions, Iverson and Lee (1994) proposed three constraints for the analysis of CCS in Korean:

Peripherality

Parse peripheral specifications.

Coda Sonority

In syllable codas, parse sonorant segments.

Coda Nonrelease

Parse root node features.

They argue that the variation in /lp/ (either [l] or [p]) and /lk/ (either [l] or [k])
cluster is accounted for by manipulating the rankings between Peripherality and Coda
Sonority. For speakers who put Peripherality constraint higher than Coda Sonority, as
the case of standard dialect in (14-a), peripherals (labials and velars) are chosen as final
outcomes (/lp/→[p], /lk/→[k]), whereas, for speakers who put Coda Sonority higher
than Peripherality, as the case of Gyeongsang dialect in (14-b), the results are opposite
(/lp/→[l], /lk/→[l]). The examples presented in (14) illustrate how their analysis works.

(14)   Iverson & Lee (1994: 179)

a. /hulk/ 'soil' → [huk] (Standard dialect)   Peripherality >> Coda-Son

Candidate	*Complex	Parse	Peripherality	Coda-Son
hulk	*!			
☞ hu <l> k		*		*
hul <k>		*	*!	

b. /hulk/ 'soil' → [hul] (Gyeongsang dialect)   Coda-Son >> Peripherality

Candidate	*Complex	Parse	Coda-Son	Peripherality
hulk	*!			
hu <l> k		*	*!	
☞ hul <k>		*		*

In the case of clusters that include a consonant with a laryngeal feature, such as /lp^h/ and /lt^h/, the Coda Nonrelease constraint (parse root node feature), which prevents laryngeal node from the output, is added since Peripharality does not rule out laryngeal nodes from the output.

When the three constraints are reviewed, the notions of coda sonority and coda nonrelease have been claimed consistently throughout the previous studies (Kim-Renaud 1974, Iverson and Kim 1989, Oh 1994) with relation to codas in Korean. Regarding the Peripharality constraint, however, a couple of theoretical issues come to mind. According to Iverson & Lee, the status of peripheral node plays a pivotal role in accounting for some phonological phenomena such as place assimilations in Korean. The node "Peripheral" itself seems to be not a problem at all as far as phonological representation concerns. As Kenstowicz (1993) has pointed out, as for the choice of segments in CCS in Korean, the hierarchy of place of articulation (labial, velar> coronal> laryngeal) seems to be related to the possible outputs; for example, in the sequences of coronal-labial (/lm/, /ps/) and velar-coronal (/ks/), labial and velar are realized as phonetic outcomes respectively. In fact, by posing the 'Peripheral' node between oral-place and articulator (labial or dorsal) node, the pattern of the preferred outcomes in CCS can be generalized in terms of feature geometry. The problem is that while the Peripherality constraint does play a role in heterorganic non-coronal–coronal sequences, with relation to homorganic coronal-coronal sequences, it cannot capture some of the possible outcomes. According to Iverson and Lee, for example, in the /lt^h-C/ clusters, the winning outcome is always [l] (/halt^h-ta/→[hal-ta], /hwult^h-ta/ →[hwul-

ta]). In this case, the Coda Sonority constraint plays the decisive role, since both of the consonants /l/ and /t^h/ are non-peripheral. Although within the prescriptive grammar of Korean, Peripherality is not problematic since [l] is assumed to be the only possible outcome, in reality, as variation studies of CCS (Park 1990, Hong 1991) show, [t] is also a possible outcome in /lt^h-C/ cluster. (Note that in coda position, /t^h/ is neutralized as /t/. Therefore, the /lt^h-C/ cluster is ultimately considered as a coronal-coronal cluster /lt/)

Based on these facts, this study seeks to account for coda-related variation by proposing an alternative to the Peripherality constraint, a revised coda-related constraint, namely, "Coda-Place." The basic idea of the Coda-Place constraint is that if we assume that in Korean phonology /t/ is the most unmarked segment, and no place node is specified, it is more straightforward to say that codas should be specified only by a major place node: Coda conditions. As previous studies show (Itô 1989, McCarthy and Prince 1993b, Itô and Mester 1995), in many languages, coda conditions typically have connections with place nodes. By employing the notion of Itô's coda condition, the analysis of CCS in Korean can successfully captive cross-linguistic generalizations. As a result, appealing to some kinds of coda conditions seem to be a more appropriate way of pursuing an analysis of CCS in Korean. A detailed discussion of the coda conditions will be presented in later chapters.

Recently, Cho's (1999) constraint based approaches for explaining CCS shed new light on this analysis. He analyzed CCS with relation to intra-dialectal variation based on phonetically motivated constraints within optimality-theoretic framework.

According to Cho, in the CCC environment, perceptual saliency of the target consonant and the following consonant play a crucial role in deleting or preserving one of the consonants. More specifically, perceptually more salient segments are preserved while perceptually weak segments are deleted. For example, when the segments, /k p t/ are compared in the same environment (such as l__C), most perceptually salient /k/ is frequently preserved while least salient /t/ is frequently deleted. Cho formalizes these notions in terms of two constraints:

Weakening

Conserve articulatory effort (Jun 1998:383).

Preservation

Preserve cues for place, manner and other properties of a segmental class X (Jun 1998).

As far as variation is concerned, Cho claims that constraint rankings between Weakening and Preservation are the motivation, therefore, the variation in CCS is noticeable in intra-dialectal level.

Cho's (1999) argument based on physiological universality proposes another way of looking at the issue of CCS in Korean. In particular, his analysis of variation in CCS from intra-dialectal level suggests that unlike most of the previous studies, regional or dialectal factor is not the only motivation for the variation in CCS in Korean. Cho's paper provides valuable insight with relation to the factors accounting

for variation in CCS. However, the concept of perceptual saliency seems to pose a methodological problem: defining and measuring perceptual saliency of a segment were not clearly described.

2.5 Sociolinguistic Approaches

Apart from the previous studies, Park's (1990) approach to CCS is unique in that is purely motivated from sociolinguistic factors such as region, social class, gender and age. Her study claims that in order to capture a more realistic and appropriate account for the observed variation in CCS, sociolinguistic factors reflecting characteristics of heterogeneous speech community should be considered. According to Park, purely formal, language-internal approaches are problematic since the analyses start from the assumption that the speech community is homogeneous. Indeed, the result of her research supports the assumption that social variables are crucial factors in the analysis of CCS in Korean. According to her, CCS in Korean can be summarized as two consonant rules: a) $l \rightarrow \emptyset /$ _CC and b) $C \rightarrow \emptyset /$ C_C; In addition, there are differences in the rate of rule application depending on the social factors, age (under 10, teenagers, 20-39, and over forty) and social context (reading, lecturing, conversation). With respect to the age factor, the first rule (a) application was discovered to be predominant from teenagers to subjects under forty years old. For subjects over forty, the two rules, (a) and (b), were competing. In the case of social context, rule (a) was discovered to be predominant in the reading and lecturing context. The results from Park's study open a different way of looking at CCS issue from the previous theoretical approaches. In CCS in Korean, variation is apparent, and social factors play roles in the variation. Although

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Park's analysis is somewhat problematic since regarding class and age variables, she did not take into account regional factors which are very influential in CCS variation, her study suggests significant points with relation to the issue.

While Park's research was based on purely social variables, Hong's (1991) CCS analysis considered both linguistic (following consonant) and social factors (social class, age, gender) as variables causing variation. The results of her analysis also showed a relationship between variation and social factors: younger men tend to produce innovative forms more frequently (e.g., the [l] form in /lk/ and /lp/ clusters) than older men. As for the social class factor, the results suggested that the upper class tend to produce the innovative form more frequently than the middle class. In addition to the social factors, Hong claims that variation in CCS is more closely related to language-internal factors (phonological, morphological and syntactic conditions): i) variation occurs differently depending on the lexical category of cluster coda words, and ii) variational pattern depends on the following segments, /k, n, t, s, c /. Although Hong's study is insightful in the sense that she considers both linguistic and non-linguistic factors in accounting for CCS, with relation to the variation, her analysis is still limited to a description of the phenomenon based on various rules rather than provides any sort of explanation.

2.6 Summary

In most of the previous studies, the variation in CCS has been assumed to be caused only by dialectal deviation. Accounting for variation in terms of social factors has been far less examined. Somehow, this can be considered as a consequence of

limiting focus: researchers have focused attention either on language-internal properties or on language –external properties. Thanks to a couple of variational studies of CCS (Park 1990, Hong 1991), the assumption of homogeneous speech community in CCS was shown to be inadequate; one can thus conclude that more language-external factors need to be considered for better understanding of variation in CCS.

In dealing with linguistic phenomena, both language–internal and language-external approaches provide important facts about language. For example, language-internal approaches to understanding CCS explore phonologically or phonetically motivated linguistic facts while language-external approaches explore socially motivated language variation. As the previous studies indicate, the analysis of CCS has most often been conducted based exclusively on either one or the other of the perspectives. Developing linguistic variation and linguistic change, however, cannot be only a matter of linguistic structure nor only a matter of social setting. As Labov's (1963) vowel study suggests, language variation and change are involved in both linguistic system and social forces. In other words, employing both linguistic constraints (language-internal constraints) and social constraints (language-external constraints) is considered to be the most fruitful strategy for pursuing CCS analysis. Therefore, one of major aims of this study is to advance our understanding of CCS in Korean by espousing an approach that explicitly combines language-internal and external constraints.

CHAPTER 3

THE HYPOTHESES

3.1 Introduction

Based upon the discussion in Chapter 1 and 2, Chapter 3 presents the research

questions for this study more explicitly in terms of hypotheses that explore the various

linguistic and non-linguistic factors that can be invoked to explain the variation in CCS.

As for the linguistic factors, the hypotheses reference variables such as lexical

categories and types of segments following the target words. Hypotheses regarding non-

linguistic factors include those pertaining to age, gender, educational level, and speech

register of the target words.

3.2 Linguistic Factors in the Variation

3.2.1 Lexical category and Following segment type

In explaining a phonological or morphological process, a researcher must

consider the role played by linguistic factors, such as the sequence of phonological

segments, syllable structure, lexical category of words, and stress patterns. The earliest

works in generative linguistics (Chomsky and Halle 1968) make clear that language

internal factors (or "linguistic context") influence how an underlying form is realized on

the surface. For example, Chomsky and Halle (1968) formalized the notion of linguistic

context (e.g., the information included after "/" in a phonological rule); they make

explicit reference to lexical categories as they condition phonological rules in English

(e.g., their "Main Stress Rule" as it applies to nouns and adjectives, p. 84); and they provide an account for morphological information, distinguishing between various types of "formative boundaries" (e.g., " +" vs. "=", pp. 364-372). More recent work, however suggests that both the nature of grammar and consistency of phonetic representations are more complex.

In their work in the field of "emergent grammar," Bybee (1985, 1988), Hopper (1987, 1991), and Philips (1998) argue that knowledge of language use is a combination of language internal information and language external experience, such as frequency of occurrence. When people speak, instead of using isolated morphemes or words from an abstract lexicon, their utterances depend on their memory or processing contain multiple morphemes and words related to recurrent patterns. For example, verbs in English typically occur in multiple word patterns (Hopper 1991): *wake up, speeded up, head straight in, has drifted left, start exploding* and so on. In these kinds of expressions, the verb part (e.g. *wake, speed*) and the functional part (e.g. *up, in*) are not readily separable. Rather the entire complex is stored as a recurrent unit in thelexicon.

Researchers in the field of sociolinguistics have likewise claimed that structural (language-internal) factors are critical to understanding patterns of language variation. In his study of New York City, Labov (1966) found that raising of /æ/ as in the Northern Cities occurs only when /æ/ occurs in certain phonological environments. Other linguistic factors found to be relevant to variation studies include (but are not limited to): nature of the following segment (Gordon 2001b and Eckert 2000) and the lexical category of the target word (Neu 1980).

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CCS is sensitive to language internal factors. Informal observation of CCS among Koreans in everyday situations, for example, reveals that the output forms vary depending on at least two factors: the lexical category of the word, and the following segment. Before a vowel, the variation is attested only in the noun category while before a consonant only the predicate category shows variation.

While much of the literature on CCS has made the faulty assumption that speakers are consistent in their simplification strategies, a couple of authors have pointed out that there is variation in CCS depending on linguistic context. Park (1990) and Hong (1991) argue that phonetic realizations of CCS are related to such linguistic factors as lexical category of the word and the following segment type. Thus, the following two hypotheses regarding variation in CCS emerge:

< Hypothesis 1 (Lexical category and Variation) >

In CCS in Korean, both the degree of variability and the shapes of the surface variants depend on the target item's lexical category.

< Hypothesis 2 (Following segment type and Variation) >

In CCS in Korean, both the degree of variability and the shapes of surface variants depend on the segment immediately following the target cluster.

As examples presented in Chapter 1 indicate, the patterns of the variation in CCS suggest a possible connection with linguistic factors such as lexical categories and

following segment types. Before a vowel, the variation is attested only in the nouns while before a consonant only the predicates show variation. In addition to the observed linguistic forms, the structural information that in Korean the predicates show a variety of inflection by combining with the following segments while the nouns do not can be exploited as evidence supporting the relationship between the two linguistic factors and the variation.

3.3 Non-linguistic Factors in the Variation

In language variation, one cannot ignore the role played by language external factors. The issues raised in Chapter 2 (e.g., age, gender, style) are likely to emerge as important contributors to understanding CCS patterns. In this section, we will consider four specific hypotheses regarding non-linguistic issues, and motivate each. More specifically, each hypothesis addresses patterns of the innovative forms ([l] forms in the /lk/ and /lp/ cluster predicates), which Hong (1991) suggests are correlated with social factors.

3.3.1 Age

Throughout the previous research (Trudgill 1988, Bailey et al. 1991, Chambers 1995, Eckert 1997), age has been examined as one of social factors representing language change. More specifically, different patterns across generations of speakers can be interpreted as evidence of a change in progress based on the apparent time hypothesis. In this hypothesis, speakers from different age groups can be regarded as representatives of different time periods; therefore, by comparing different age groups synchronically, diachronic linguistic change can be inferred. For example, in the study

of New Zealand English intonation, Britain (1992) suggested a change of intonational pattern by comparing the frequency of an intonation contour (high rise and its end) in the speech of speakers from three different age groups: 20-29, 40-49, and 70-79. In this analysis, he found that the use of the intonation pattern is increasing across the age groups: the oldest groups used it the least, middle-age group use it more than the oldest, and the youngest group showed the most frequent use of the pattern.

While Britain's study explained a linguistic change in progress by employing numerical age classification, in some other studies, age-related variation has been examined based on the concept of "life stage" (Eckert 1997), which distinguishes an individual's age basically into three social statuses: childhood, adolescence, and adulthood (and each can be subdivided). According to Gordon (2001b), the binary division of his Michigan subjects based on life stage, adolescents and middle-age adults, reflects a clear difference in their involvement in linguistic change. Adolescents tend to use more innovative forms while middle-aged adults tend to be conservative. Regarding the difference, Eckert (1997) suggests that adolescents typically try to establish their identity by opposing their elders.Whether they are based on numerical classification or based on life stage, the cited studies show that age plays a role in a linguistic change.

In the case of variation in CCS, the age-related effect is motivated from the assumption that a linguistic change appears to be in progress in this phenomenon. Particularly in Korean culture, one expects that age will play a critical role in understanding language variation since age is perhaps the most important factor in determining an individual's social status. As a society built largely upon Confucian

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principles, Korea has many age-related norms. For example, younger people should be polite to elders and elders should be considered before younger people (Hankyure 21 2002). With relation to linguistic norms for elders, Korean has a great many of honorific markers and vocabulary: a student might ask a professor *mwuel haseyo* 'what are you doing? (polite with the honorific affix –*seyo*) while the professor would ask the same question of a student saying *mwuel hay*? (plain, without –*seyo*). In every social structure, including home, work-place, school, and neighborhood, one's age is a critical factor deciding one's appropriate behavior.

Also, the very small literature on language variation in Korean confirms that age is, in fact, a relevant non-linguistic feature. For example, in the study of CCS in Korean, Park (1990) and Hong (1991) pointed out that there is a difference regarding phonetic realization of cluster coda words depending on the age of speakers. Silva (2004) also indicates that different VOT values are related to speakers' age.

As a matter of fact, including Hong's (1991) study, informal observation of contemporary Standard Korean indicates that there is an increase in preference of non-standard [l] forms regarding /lk/ and /lp/ clusters. Based on the observation, this research suggests Hypothesis 3:

< Hypothesis 3 (Age and Variation) >

In CCS in Korean, younger speakers tend to produce innovative forms more often than older speakers; age-based variation results from different rankings of the CODA constraint between younger speakers and older speakers.

Sometimes variability in language is regarded as an unstable stage of linguistic change. When a change is in progress, the established linguistic features are often more stable for older people than younger people, and this is attributed to the general tendency that older people tend to be conservative while younger people tend to be innovative (Chambers 1995). With respect to variation in CCS, Korean society is considered to be not so different from the previously reported societies. In Korean also, it is assumed to be younger speakers who prefer innovative forms rather than older speakers.

3.3.2 Gender

In much of the literature on language variation studies (Labov 1972, Wolfram and Fasold 1974, Trudgill 1983, Holems 1993, Milroy et al. 1994, Romaine 1998), the differences between men and women in their linguistic pattern have been claimed in terms of their different orientation to a prestige norm. While in some studies (Trudgill 1974, 1983, Milroy et al. 1994), the role of gender regarding a prestige norm emerged straightforwardly in the sense that women use more standard forms than men, in other studies (Horvath 1985, Chambers 1995, Milroy 1999, Watt and Milroy 1999) the

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connection between women and a prestige norm has been reported, that women create

prestige variants rather than prefer a prestige norm. According to Milroy 1999 and Watt

and Milroy 1999, in the northern English city of Newcastle upon Tyne, four variants of

vowel (o) are identified- [o:], [œ], [oə], and [ou]. Among these variants, the widely

distributed northern variant [o:] is overwhelmingly preferred by women while the more

localized two forms, [œ] and [oə], are not used at all. In contrast, men preferred the two

localized forms. In addition to the study of variant (o), in such studies as glottal stop (t)

variants (Holmes 1997) and the standard fricative (th) and (dh) variants (Horvath 1985),

women tend to favor the forms that are widely distributed, supralocal variants. In this

case, the forms are not necessarily prestige forms; rather, women's language is

ideologized as prestige variants.

As a society that has much male-oriented tradition, Korea reveals the social role

of men and women to be clearly distinguished. Traditionally, the part played by men is

related to social activities while the part played by women is to take care of domestic

affairs. Moreover, male-superiorism from Confucian principle has been dominant (Oh

J.S.1991), and because of that inequality, traditional gender roles have been enforced in

Korean society. For example, since only a man can be a successor of blood lineage in a

family, a man's status within a family and a community tends to be emphasized with

reference to his identity (Kong 1993). Therefore, in Korean society men are typically

more conservative than women since it has been men's responsibility or privilege for

keeping the local norms. Although by means of industrialization, traditional viewpoints

about social gender role have been changing, it is still not difficult to identify gender

related customs or expressions in modern Korean society.

Considering the Korean circumstance, gender can be an influential factor with

regard to language variation. As a matter of fact, their studies of CCS, Park (1990) and

Hong (1991) suggested that there is relationship between gender and variation. Based

on the discussion presented so far, this research suggests Hypothesis 4 concerning the

role of gender in the variation.

< Hypothesis 4 (Gender and Variation) >

In CCS in Korean, female speakers tend to produce innovative forms more

often than male speakers, and those variations result from different

rankings of CODA constraint between female speakers and male speakers.

With relation to variation in CCS in Korean, this research on gender differences

departs from the previously suggested generalization that men are more conservative

than women, so the localized forms tend to be reinforced by men. Furthermore, the fact

that the innovative [l] forms not only appear in the non-standard pattern, but also appear

in the standard pattern depending on grammatical categories or kinds of following

consonants elicit a different attitudes towards innovative [l] forms (when /lk/ cluster

words are followed by the consonant 'k,' their prescriptively correct forms are [l] forms

while before 't' [k] forms are correct forms:e.g. /ilk-ko/ 'read and' → [il-ko], /ilk-ta/

'read' → [ik-ta]). The innovative form [l] is hardly assumed to be a stigmatized or non-

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standard form by the standard dialect speakers of Korean; rather they are simply a wider range of variety, or linguistic repertoire. In Hypothesis 4, the patterns of variation are examined with reference to men's conservatism and women's preference for a wider range of variety.

3.3.3 Educational Level

In the research on language variation, speakers' social class has been claimed as an index interpreting their linguistic behaviors (Labov 1966, 1972b, Wolfram 1969, Trudgill 1974, Rickford 1986, Milroy 1992, Eckert 2000). Since indices of social class are defined distinctively based on the value-system of the society, different indices of social class have been employed for variation analysis. For example, in the study of New York City, Labov (1966) used three factors- education, occupation, and income- and discovered that with relation to the two variables, [ð] (the standard variant), [d] (non-standard variant) of (dh)-the initial consonant in words such as *them, that*- the higher social group, LMC (lower middle class), used fewer non-standard variants than the WC (working class).

There are several studies that have been done by using only one indicator, such as occupation or education in deciding a speaker's social class. Macaulay (1977) employed occupation alone in his Glasgow study, and the results support his reliance on occupation as an indicator of social class. In many of the variation studies on Arabic-speaking countries, education level has been used as a social class indicator (Al-Wer 1997, Abd-El-Jawad 1989, Abu-aider 1989, Jahangiri and Hudson 1982). In these studies, higher level of education is not related to proficiency in Classical Arabic; rather

it shows a connection with Classical Arabic variants. According to Al-Wer (1997), in the Arab world, since education provides a chance for a speaker to change his/her social network by interacting with speakers from various places, often educated speakers lead linguistic changes from the Classical Arabic toward supralocal, or urban variety of the standard.

While in Arabic-speaking society higher educational level is discovered to be related to linguistic change or a wider range of variety, some studies claim that lower education level causes frequent use of non-standard forms since education often enforces standard norms of a community (Romaine 1982).

Considering the social and cultural norms of Korean society, the importance of education as an indicator of social class for a speaker can be examined with relation to variation in CCS. In Korea, educational level is one of the most important social factors that determine social status of a speaker. To attach great importance to education has been a long-time tradition of Koreans, and it is still true in modern times (A Handbook of Korea 1987). A couple of relatively recently coined lexical items indicate this: 'insurance for education-insurance for child's future education' and '*Jaesusang*'-a person who failed in entering a college and so has been preparing to take a college entrance exam again. In addition, some research in sociology (KimY-M 1992, Sin K-H 2001) has claimed that higher incomes are correlated with higher education, and in many cases, one's economic status stands for his/her social class. Therefore, considering the significance posited on education and its correlation with

socioeconomic status in Korean society, a speaker's educational level can be interpreted as an indicator of social class.

Efforts that try to elaborate a speaker's educational level into a meaningful factor in linguistic patterns have been made through a couple of pieces of research on the variation analysis in Korean (Hong 1991, Silva 1991). Although in these studies, educational level is not discussed directly with relation to the results, they do suggest that educational level does play a significance role in determining a speaker's social class.

Based on the idea that educational level is one of the primary or fundamental elements deciding one's social class and does play a role in the pattern of variation, this research suggests Hypothesis 5 investigating the role of speakers' educational level in the variation:

< Hypothesis 5 (Educational Level and the Variation) >

In CCS in Korean, lower educated speakers tend to produce the innovative forms more often than more highly educated speakers, and those variations result from different rankings of CODA constraint between lower educated speakers and higher educated speakers.

In Hypothesis 5, lower educated speakers are suggested to be more frequent users of innovative forms than higher educated speakers since higher education is assumed to enforce the standard norm with relation to linguistic pattern. In fact, Korean

prescriptive grammar clearly defines what is standard and what is not, at least within the educational system, where standard norms are emphasized. However, in this case, high or low level of education itself is not interpreted as an indicator of different usage of variant forms. Lower educated speakers tend to be correlated with lower social class, so in this case a speaker's lower education re-evaluated in terms of his/her lower social class. Thus, Hypothesis 5 can be justified by taking the idea that non-standard forms (innovative forms) are often produced more by lower class speakers.

3.3.4 Register

Throughout previous studies (Labov 1972b, Biber and Finegan 1994, Eckert 2000), styles or registers have been explicated as factors causing linguistic variation, and in this case speakers' level of awareness is frequently referred to with respect to the variation. In Labov's (1972b) approach to stylistic variation, which employs the concept of self-consciousness in speech, five styles are represented as a certain kind of continuum from most casual to most careful (casual and formal conversational styles, a passage reading, a word list reading, and minimal pair reading). According to Labov, casual styles elicit speakers' more vernacular like forms associated with less self-monitoring speech, while formal styles draw forms associated with much more self-monitoring speech. For example, in the study of social and stylistic stratification of (r) in New York City, Labov (1966) discovered that regardless of social class, standard variant [r] was produced most frequently in the minimal pair style (the most conscious style) while non-standard variant Ø was produced most frequently in the casual speech style.

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As the previous studies indicate, the relative formality of speech tends to adjust a speaker's pronunciation toward more standard forms. In other words, non-standard forms are more often produced in casual speech. Based on this, Hypothesis 6 can be formulated:

< Hypothesis 6 (Register and the Variations) >

In CCS in Korean, speakers tend to produce the innovative forms more often in casual speech than in formal speech, and those variations result from speakers' different ranking application of CODA constraint depending on speech environments.

In this research, patterns of speakers' production of CCS are analyzed by using Labov's model. By means of comparing casual speech with formal speech, variation motivated from context-sensitivity, or situational factors is examined. Speakers' different linguistic behaviors in using particular variants in particular environments are explored as one of the constraints causing variation in CCS.

3.4 The Experiment

The hypotheses presented in this chapter are examined by means of a linguistic experiment designed to elicit speakers' production of various CC and CCC clusters in Korean. The experiment is composed of four different tasks: a direct repetition task ("echo game"), reading narrative text, reading short sentences, and reading individual target words. The results of the experiment not only show various aspects of language use and dynamics in the variation in CCS but also explore how language-external

constraints, age, sex, the level of education, and register, interact with the established language-internal constraints.

3.4.1 Methodology

3.4.1.1 Subjects

For this study fifty-five native speakers of the standard dialect of Korean were recruited as subjects. In order to rule out dialect variation and focus on the matter of intra-dialectal variation in CCS, only one dialect, the standard dialect, was considered as the target dialect. There are a couple of reasons that the standard dialect was chosen as the target dialect. First of all, in most of the previous studies of CCS, the standard dialect was the target variety. In addition, since the standard dialect is the native dialect of the researcher, this researcher was most confident in doing the research with speakers of the same dialect. The subject pool was limited to those who lived in Seoul and surrounding Gyeonggi Province from childhood to the present and who were educated in the Seoul and the Gyeonggi area. The definition of the standard dialect speaker is stated in (15), and it is based on Hong (1991).

(15)   Definition of the standard dialect speaker

The standard dialect speakers are those who have lived in Seoul and Gyeonggi area from the first grade of elementary school (from the age of 6~8) until the age of twenty or so.

Information about the social background of the subjects was collected through a prepared questionnaire (appendix I). The content of the questionnaire includes questions

about age, sex, level of education and so on. Since age and sex variables are assumed to play a role in this study, the number of the informants for each age (from teenagers to sixties) and each sex was distributed as evenly as possible. Table 3.1 summarizes the demographics of this research.

Table 3.1 Demographics of the fifty-five subjects

highest level of education	gender	before 1955	1956- 1965	1966- 1975	1976- 1985	after 1985	total (n)
college	male	1	3	4	5	0	13
	female	1	0	4	5	0	10
high school	male	1	0	2	7	0	10
	female	1	7	2	2	0	12
middle school	male	0	1	0	0	4	5
	female	1	0	0	0	4	5
total (n)		5	11	12	19	8	55

3.4.1.2 Materials

The target words for this study were eight monosyllabic nouns and fourteen predicates having morpheme-final consonant clusters. Each target word was designed to be produced in two different linguistic environments. The first was the case in which a consonant follows the target words. When the target words were monosyllabic nouns, a

suffix that begins with a consonant, -to 'also,' was used equally after the target noun in the carrier sentences:

(16) oli   to   ta**lk   to**   eps-ess-ta.
      duck   also   chicken   also   not exist-Past-Dec.

     'There was no duck and no chicken.'

When the target words were predicates, by using inflectional endings that begin with a consonant -ta and -ko form, the carrier sentences were made:

(17) a. Nwukwun –ka   pa**lk-ta**   lako   malha-yss-ta.
         Somebody- Nom.   bright   CI   say-Past-Dec.

     'Somebody said bright.'

    b. Nwukwun –ka   pa**lk-ko**   ma**lk-un** hanul   ilako   malha-yss-ta.
         Somebody-Nom.   bright-and   clear-AM   sky   CI   say-Past-Dec.

     'Somebody said bright and clear sky.'

The second is the case that a vowel is followed by the target words. The suffixes -i and -un were used when the target words were monosyllabic nouns:

(18) a. oli -ka   ta**lk - i**   toy-ess-ta
         duck-Nom.   chicken-Com   become-Past-Dec.

     'A duck became a chicken.'

b. *ku   kos-ey*   *ta<u>lk</u> -**un***   *iss-eyo.*
    that place-Loc.   chicken-TC   exist-POL

    'There is a chicken.'

In the case of predicates, by using the inflectional ending *-un*, the target words were carried in sentences:

(19)   *nwukwun –ka*   *pa<u>lk-**un**</u>*   *hanul ilako   malha-yss-ta.*
          Somebody-Nom.   bright-AM   sky   CI   say-Past-Dec.

          'Somebody said bright sky.'

The representative examples of both the echo game and the sentence reading task are provided in (20) and (21) respectively. The full texts for each task appear in Appendices B-E.

(20) Test sentences for the echo game (Task I)

    1. *ku kos-ey-nun*   *oli -to*   *talk –to*   *eps-eyo.*
       that place-at-TC   duck- also   chicken-also   not exist-POL

    'There is neither duck nor chicken'

    2. *ku kos-ey-nun*   *mole -to*   *hulk –to*   *eps-eyo.*
       that place-at-TC   sand- also   soil-also   not exist-POL

    'There is neither sand nor soil'

3. *ku kos-ey-nun*   *cwukum -to*   *salm –to*   *eps-eyo.*
   that place-at-TC   death- also   life-also   not exist-POL

'There is neither death nor life'

4. *ku kos-ey-nun*   *paykil[6] -to*   *tols[7] –to*   *eps-eyo.*
   that place-at-TC   paykil- also   tols-also   not exist-POL

'There is neither hundredth day nor the first birthday'

5. *ku kos-ey-nun*   *ilkop -to*   *yeotelp –to*   *eps-eyo.*
   that place –at-TC   seven- also   eight-also   not exist-POL

'There is neither seven nor eight'

6. *ku kos-ey-nun*   *sichey -to*   *neks –to*   *eps-eyo.*
   that place -at -TC   corpse- also   soul-also   not exist-POL

'There is neither corpse nor soul'

7. *ku kos-ey-nun*   *hyuka -to*   *saks –to*   *eps-eyo.*
   that place–at-TC   vacation- also   wage-also   not exist-POL

'There is neither vacation nor wage'

8. *ku kos-ey-nun*   *sangphyo -to*   *kaps –to*   *eps-eyo.*
   that place-at-TC   label- also   price-also   not exist-POL

'There is neither label nor price'

9. *ikes-un*   *palk-un*   *ilako*   *ha-ciyo.*
   this-TC   bright- AM   CI   do (say)-POL

'It is said that bright'

---

[6] A party celebrating the hundredth day of the birth of a baby
[7] A party celebrating the first birthday of a baby

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10. *ikes-un*   *nulk-un*   *ilako*   *ha-ciyo.*
   this-TC   old- AM   CI   do (say)-POL

'It is said that old'

(21) Test sentences for the sentence reading (Task III)

1. *ku cip-ey-nun*   *oli-to*   *talk-to*   *eps-ess-ta.*
   that-house-at-TC   duck-also   chicken-also   not exist-Past-Dec.

'There was no duck and no chicken in the house.'

2. *chenkwuk-eynun*   *cwukum-to*   *salm-to*   *eps-ta.*
   heaven-at-TC   death-also   life-also   not exist-Dec.

'There is no death and no life in heaven.'

3. *ku aki-eykey-nun*   *paykil-to*   *tols-do*   *eps-ess-ta.*
   that-baby-to-TC   paykil-also   tols-also   not exist-Past-Dec.

'That baby had neither a hundredth day nor a first birthday celebration.'

4. *ku salam-eykey-nun,*   *ilkop-to*   *yeotelp-to*   *cekta.*
   that person –to-TC   seven-also   eight-also   little

'For the person, both seven and eight are little.'

5. *ku kos-ey-nun*   *sihey-to*   *neks-to*   *eps-ess-ta.*
   there-at-TC   corpse-also   soul-also   not exist-Past-Dec.

'There was no body and no soul in the place'

6. *ku ilkkwun-eykey-nun,*   *hyuka-to*   *saks-to*   *eps-ess-ta.*
   that-worker-to-TC   vacation-also   wage-also   not exist-Past-Dec.

'There was no vacation and no wage for the employee'

7. *I mwulken- ey-nun   sangpyo-to   kaps-to   epsta.*
   this- goods-at-TC   label-also   price-also   not exist

   'There is no brandname tag and no price tag.'

8. *nwukwun-ka   hanul-i   palk-ta -lako   malha-yss-ta.*
   Somebody-Nom.   sky-Nom.   be bright-CI   say-Past-Dec.

   'Somebody said that the sky is bright.'

9. *nwukwun-ka   salam-i   nulk-ta- lako   malha-yss-ta.*
   Somebody-Nom.   people-Nom.   be old-CI   say-Past-Dec.

   'Somebody said that people are old.'

10. *nwukwun-ka   chek-ul   ilk-ta lako   malha-yss-ta.*
    Somebody-Nom.   book-Acc.   read-CI   say-Past-Dec.

    'Somebody said that s/he was reading a book.'

In addition to the sentences, for the experiment on stylistic variation, the target words were embedded in a narrative text. The linguistic representations of the target words are the same as the forms in the sentences. Since the narrative text is much longer than the sentences and has a story line, the subjects are assumed to pay less attention to their pronunciation, thereby yielding output that is closer to their casual, natural speech. The narrative text developed by the researcher is provided in (22). The bold-faced words are the target words (total 18 words). The actual narrative text (written in Korean) used for the subjects is provided in Appendix D.

(22)   Text for narrative text reading (Task II)

cinancwu, sikol-ey sa-si-nun   oyhalmeni-cip-ey ka-ss-ul ttayuy il-ita.
Last week   rural-at   live-honorific-AM   grandmom- house-at   visit-Past-AM when happening-Dec.

samyen-cen oyhalapeci-kkeyse tolaka-si- ko holo-toysin halmeni-kkeyse-nun
Three years –ago grandpa-Nom. (honorific) died-honorific and alone-be grandmom-Nom.(honorific)-TC

cangsenghan casik-ul   twu-kodo,   halapeci-uy 1) neks-i   paye-iss-nun
grown-up   children-Acc. have-though   grandpa-Poss.   soul-Nom.   Exist-be-AM

kohyang-ttang-uy hulk-ul 2) palp-ko salaya-hannamye 3) nalk-ko, coguman
Hometown-earth-Poss. soil-Acc.   tread-with   live- should   shabby-and   small

sikol-cip-eyse holo sa-si-ko-iss-ta.
rural-house-at   alone live-honorific-prograssive-be-Dec.

4) nulk-ko, honca-i-sin emeni kekceng-ey, 5) ccalp-ko pappun cwumal-ilado,
    Old-and   alone-be-honorific mother worrying-because short-and   busy weekend-even though

emeni-wa apeci-nun nul halmeni-wa hamkkey ha-sy-ess-ta. Phyeongsoey-nun
Mother-and father –Nom. always grandmom-with together   do(stay)-honorific-Past-Dec. usually-TC,

6) yeotelp-sal-ccari dongsang-man   pwumonim-ul   ttaranaset-ciman,
    eight-year –olds   younger brother-alone   parents-ACC.   follows-but

kunal-un   oyhalmeni-do poyp-ko, 7) malk-ko, 8) nelp-ko, phwulun sikol
that day-TC   grandmom-also see-and   clean-and   broad-and   green   rural

phwungkyeng- do polkyem, 9) ilk-ko-iss-ten   kyokwase-lul twuylo-ha-ko,
scenery-also   see   read-Prograssive-be   text book-Acc.   Leave behind-do-and

kosamin   na-do   pwumonim-ul ttalanas-ess-ta.
high school 3rd grad   I-also   parents-Acc.   Follow-Past-Dec.

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ku-nal achim, sachon-enni ches aki-uy **10) tols-i**-lamye,
that day morning cousin- sister first baby-Poss. first birthday-be-CI

emeni-kkeyse-nun nuna cip-ey tullesstaka halmeni-cip-ulo
mother-honorific-TC sister house-at drop-by grandmom-house-toward

kaca-ko ha-sy-ess-ta. Aki-uy senmwu-ul sale paykwhacem-ey tulessnuntey,
go-CI do- honorific-Past-Dec. baby-Poss. Present-Acc. buy department store- at drop-by

maycang-ul **11) hwulth-ko** nasin emeni-nun mwulken **12) kaps-i** memwu
store-Acc. look around-and then mother-Nom. products price-Nom. very

pissatamyense komin-ha-sy-ess-ta.
expensive hesitate- do- honorific-Past-Dec.

setwulleya hanta-nun apeci-uy malssum-ey, emeni-nun **13) yalp-ko**
hurry-up do-CI father-Poss. saying-because mother-Nom. thin-and

14) palk-un sayk-uy aki wuenphisu-ul kolu-sy-ess-ta. Senmwul-ul tul-ko
bright color-Poss. baby one-piece-Acc. Choose-honorific-Past-Dec. present-Acc. Carry-and

wuli kacok-un, camsi, tolssanchi-lul chiru-ko-iss-nun
our Family-TC for a mome the first birthday party-Acc. hold-and –progressive-be- AM

sachon-imonim tayk-ey tull-ess-ta.
Cousin-aunt House-at drop by-Past-Dec.

canchi-lul chilu-nun imonim-uy elkwul-i **15) palk-ko** hangpokhay poy-ess-ta.
party-Acc. hold-AM aunt-Poss. face-Nom. bright-and happy seem-Past-Dec.

Emeni-uy malssum-eyuyhamyen, imonim-un hyengcey-ka
mother-Poss. saying- according to aunt-TC sister and brother-Nom.

16) yeotelp-i-na toyse elyeose kosang-ul mani hay-ss-ta-ko has-ess-ta.
eight-be- become while young hardship –Acc. much do- Past-Dec.-CI do- Past-Dec.

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17) nelp-un tosim-ul pesena, hancekhan sikolkil-lo cepetul-ess-ul ttayccum,
broad   urban-Acc. Leave,   quite   rural road- at   entered-Past-AM   when

wuli   kacok-un   ttohanpen   cha-lul   memchwue-ya ha-yss-ta.
our   family –TC   once again   car-Acc.   Stop-should   do –Past-Dec.

kil hanccok-ey   khetalan   kay-hanmali-ka   petwungkeli-ko- iss-ess-ta.
road   one side-at   large   dog-Numeral-Nom.   struggle-Prograssive-be-Past-Dec.

cha-ul seywu-ko   wuli kacok-un   ku kay-ul   caseyhi salphyepo-ass-ta.
car-Acc. stop-and   our   family-Nom.   that dog-Acc.   carefully   look-Past-Dec.

nollapkeyto, ku kay-uy   phwum-an-ey-nun   aykki-tul-i
surprisingly,   that dog-Poss.   chest-inside-at-TC   puppy-plural-Nom.

ankye-iss-ess-ko,   inkichek-ey   saykki-tul-i   tachilkka
embraced-be-Past-and,   sound of human-because   puppy-plural-Nom.   hurt

ululengkeli-mye   yensin   saykki-tul-ul   **18) halth-ko**-iss-ess-ta.
growl -with   repeatedly   puppy-plural-Acc.   lick-Prongrassive-be-Past-Dec.

<Free translation of the narrative text>

'This is a story about happenings when my family visited my grandmother out

in the countryside. Three years ago, my grandfather passed away, and since then

my grandmother has been living alone in the area, with the thought that her

husband's soul still being on the earth. Worrying about grandmother's old-age

and loneliness, my mother and father always spend every weekend with my

grandmother even though the time is short and busy. Usually my parents

accompany only my eight-year old brother for the trip to my grandmother's, but

on that day, I came with my parents, leaving my text books behind, not only to

visit my grandmother but also to enjoy the clear green scenery. That morning,

my mother said that it was the first birthday of my aunt's baby, so we should

drop by her house. We stopped at a department store to buy a present for the

baby. After looking around the store, my mother got upset because the prices of

products were very high. While she was hesitating, my father asked her to hurry

up in deciding, so she chose a thin and bright-colored dress. When we were

driving on a quiet rural road, my family stopped again. A large dog was

struggling beside of the road. After the car stopped, my family took a careful

look at the dog. Surprisingly, little puppies were together with the dog, and the

dog was growling to warn us while licking the puppies repeatedly.'

Finally, by using the word list, each target word was presented by itself without

any other supporting context. In this case, subjects' production of each target word was

considered as very careful speech. The list for the word list reading task is provided in

(23).

(23)   List for the word list reading (Task IV)

        a. *talk-i*   'chicken-Nominative marker'

        b. *hulk-i*   'soil-Nom'

        c. *salm-i*   'life-Nom'

        d. *tols-i*   'the first birthday-Nom'

e. *yeotelp-i*   'eight-Nom'

f. *neks-i*   'soul-Nom'

g. *saks-i*   'wage-Nom'

h. *kaps-i*   'price-Nom'

i. *palk-ta*   'be bright'

j. *nulk-ta*   'get old'

k. *ilk-ta*   'read'

l.*nalk-ta*   'be shabby'

m.*malk-ta*   'be clear'

n.*mwulk-ta*   'be weak'

o. *palp-ta*   'tread'

p. *nelp-ta*   'be wide'

q. *ccalp-ta*   'be short'

r. *ttelp-ta*   'be astringent'

s. *yalp-ta*   'be thin'

t. *ulph-ta*   'recite'

u. *halth-ta*   'lick'

v. *hwulth-ta*   'hackle'

Based on the linguistic environments, a total of 122 test items were created.

Because of the lexical category difference between nouns and predicates, it was

necessary to make different carrier sentences appropriate for each. Also, to avoid

semantic interference in producing the sentences, having reasonable meaning in each sentence was carefully considered.

3.4.1.3 Procedure

Each of the 122 target sentences was printed on a separate index card. In the case of the narrative text, the whole story was printed on a single sheet of paper. The subjects were guided to a quiet place and asked to perform the four different tasks. The subjects' the first task was to participate in the echo game. In the echo game, each subject was asked to produce a sentence based on the sentence produced by the researcher. The A sentences were for the nouns and the B sentences were for the predicates. The task of the subjects was to produce the sentence A-1 and B-1 by changing the underlined part after the researcher. In other words, the subjects' tasks were to do a kind of drill practice: after the researcher produce the sentence A, " *ku kos-eynun tal-to pyel-to epse-yo,* " then the subjects start to produce the sentence A-1 " *ku kos-ey pyel-un isse-yo.* " In this case, while the basic structures of the subjects' sentences are all the same (A-1 and B-1), the underlined parts of the sentences must be produced based on the sentence A (as for the A-1) and B (as for the B-1) produced by the researcher. Without any script, after several practice runs, the game was conducted.

(24) Sentence A (produced by the researcher):

" *ku kos-ey-nun*	*tal-to*	*pyel-to*	*eps-eyo.* "
that place-at-TC	moon-also	star-also	not exist-POL.

'There is neither moon nor star'

(25) Sentence A-1 (produced by the subjects):

" *ku kos-ey*   *pyel-un*   *iss-eyo.*"
that place-at   star-TC   exist-POL.

 'There is a star'

(26) Sentence B (produced by the researcher):

" *ikes-un*   *cak-un*   *i-lako*   *ha-ciyo.*"
this –TC   small-AM   be- CI   do-POL.

 'This is small'

(27) Sentence B-1 (produced by the subjects):

" *ikes-un*   *cak-ta*   *lako*   *ha-ciyo.* "
this –TC   small   CI   do-POL.

 'This is being small'

After the echo game, the subjects were asked to read the narrative text. Then, the subjects were asked to read all the 45 short sentences on index cards one by one in random order. The last task of the subjects was to read only the target word on separate index cards. During the reading tasks, index cards were controlled by the researcher. The researcher was holding the cards, and the subjects were asked to read the cards presented by the researcher. All the tasks were performed only one time. While the subjects read the words, the researcher listened to their productions carefully and marked one of the phonetic forms on the prepared score sheet (evaluation sheet). Part of the score sheet is illustrated in (28).

(28) Score sheet for the task 1 (echo game)

Subject # _____

      Korean <u>Pronunciation</u> used:

1. /talk/ 'chicken' + un (topic marker)'
    ta-kun ( )   tal-kun ( )   tak-un ( )   other _____

2. /hulk/ 'soil+ un'
    hu-kun ( )   hul-kun ( )   hulk-un ( )   other _____

3. /salm/ 'life+ un'
    sa-mun ( )   sal-mun ( )   salm-un ( )   other _____

....

As presented in (28), each target item was represented by possible phonetic outcomes. Depending on the subjects' productions, the researcher either marked one of the phonetic forms or wrote down what the subjects produced. The full versions of the score sheets are provided in Appendix H. Finally, after all the tasks, the subjects were asked to complete the demographic questionnaire.

The data were entered into an SPSS data file. In the program, each of the subjects was coded as a case and for each of the cases, the independent non-linguistic variables (age, gender, educational level, register), and the linguistic variables (following segment types, lexical category of the target words) were coded as a designated number. Part of the data file was presented in Figure 3.1.

Figure 3.1 Part of the data file created in SPSS

The variables in the first row of the file were divided into different columns, and in each

column headed by each variable, a designated number (s) was coded. For example, the

first subject (01m) was coded as number '1' regarding the sex (which means male since

male was designated as 1 and female was designated as 2) and coded as '4' regarding

the education (which means graduate school level since each educational level was

coded likewise; middle school=1 high school graduate =2 college graduate =3 and

graduate school level= 4).

To examine statistical significance in any relationship between each case and the

variables, Chi-square tests were conducted. In Chi-square tests, the observed frequency

of each phonetic form in each case was compared to the calculated expected frequency.

When the observed frequency was not significantly different from the expected

frequency, the observed frequency was assumed to be a very expected, common

occurrence. In other words, there is no relationship between the observed frequency and the tested variable. Of course, when the observed frequency is very different from the expected frequency, it means that the observed frequency is a rare occurrence; therefore, there is a significant relationship between the frequency and the case.

CHAPTER 4

THE RESULTS

4.1 Introduction

This chapter presents the results of the experiment composed of four linguistic

tasks: echo game, reading narrative text, reading short sentences, and reading individual

target words. Based on the results, firstly, this chapter addresses the hypotheses

presented in chapter 3. Then, further implications of the results are pursued by

examining and discussing various related theoretical and empirical issues. The results of

the experiments not only reveal aspects of language use and dynamics in the variation in

CCS but also indicate how language-external constraints such as age, sex, the level of

education, and register interact with the established language-internal constraints.

4.2. Linguistic Variables: lexical category, type of following segment

4.2.1 Lexical categories and the Variation

All the productions of the target words were examined based on the two lexical

categories: nouns and predicates. Under the lexical category classification, each target

word's frequency of prescriptively grammatical output was examined. Table 4.1

presents the results. In Table 4.1, the two lexical categories, nouns and predicates, were

subcategorized by the following segment types: vowel vs. consonant. Therefore, the

results were summarized by four different cases regarding the frequency of grammatical

forms. The grammatical forms refer to the prescriptively predicted forms: subjects'

productions which followed prescriptively predicted forms were coded as 'grammatical' while subjects' productions that varied from the prescriptive norms were coded as 'ungrammatical.' For example, subject # 38 produced /talk +un/ 'chicken' as [ta-kun], /hulk+un/ 'soil' as [hu-kun], and /salm+un/ 'life' as [sal-mun] and so on in the echo game. In this case, the productions of [ta-kun] and [hu-kun] were coded as ungrammatical while [sal-mun] was coded as "grammatical" based on the prescriptive grammar.

Table 4.1 The relative frequency of prescriptively grammatical forms produced for all four tasks: classified by the lexical category and the following segment type

Lexical Category		Grammatical (n)	Ungrammatical (n)	Total (n)
noun	followed by consonant	98% (529)	2% (11)	100% (540)
	followed by vowel	53% (837)	47% (729)	100%(1566)
predi-cates	followed by consonant	58% (2046)	43% (1560)	100%(3606)
	followed by vowel	98% (832)	2% (18)	100% (850)
Total		4244	2318	6562

In Table 4.1, the percentage shows the relative frequency of each case, and the raw numbers in parentheses indicate the actual number of occurrences. From Table 4.1, two interesting points can be elicited. First of all, each lexical category showed different pattern of grammaticality depending on the following segment type. When a consonant follows, while the nouns showed very low frequency of prescriptively ungrammatical forms (2%), the predicates showed much more variability: 58% grammatical vs. 43%

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ungrammatical. When a vowel follows, although the results were directly opposite of

the case of consonant, general patterns still appeared to be closely linked to the target

word's lexical category: before a vowel, the nouns showed high frequency of

ungrammatical forms (47%) while the predicates show very low frequency of

ungrammatical forms (2%).
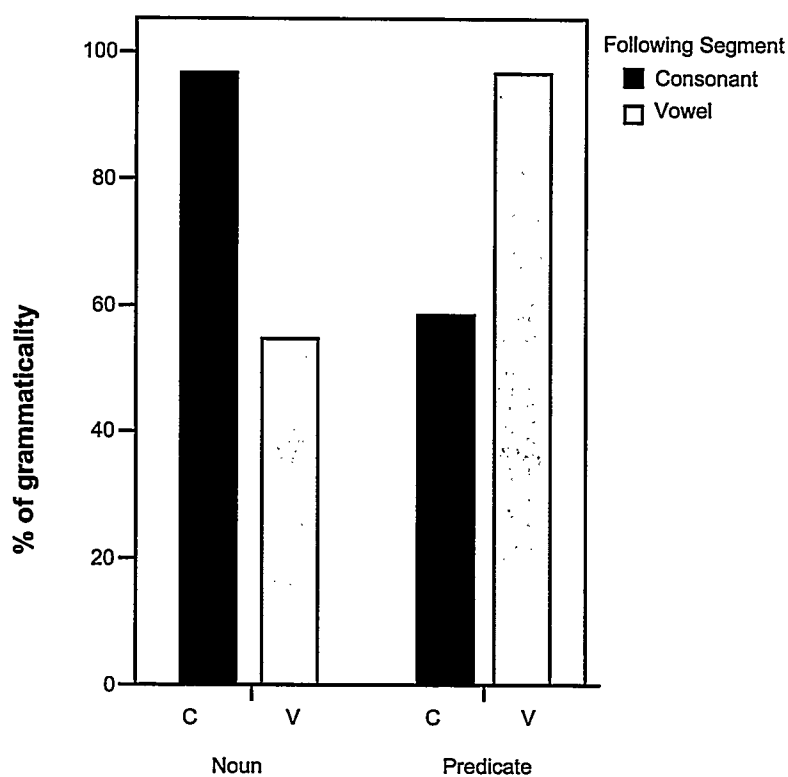
Figure 4.1 The relative frequency of grammatical form productions: classified
by each lexical category.

In addition, as graphically represented in Figure 4.1, both of the lexical categories were very sensitive to the types of the following segments. In both the nouns and the predicates, the degree of ungrammaticality (variation) appeared to be very different depending on which segment follows the target words. For example, the nouns showed high variation when a vowel follows while they showed low variation when a consonant follows. Based on these results, Hypothesis 1 can be supported: lexical categories and following segment types are related to the variation in CCS in Korean.

Given these facts, each target word's degree of variation relative to other targets needs to be more closely investigated. Table 4.2 shows the behavior of each predicate before a consonant. With relation to vowels, since the predicates showed almost no variation, only the cases that followed by a consonant were closely examined.

Table 4.2 The relative frequencies of grammatical vs. ungrammatical form productions of the predicates before a consonant for all four tasks.

Target Verb [Grammatical form]	Grammatical (%)	Ungrammatical (%)	Total N
/halt^h-ta/→ [hal-ta]	96%	4%	269
/hwult^h-ta/→ [hwul-ta]	81%	19%	269
/ccalp-ta/→ [ccal-ta]	67%	33%	269
/nelp-ta/→ [nel-ta]	66%	34%	269
/nulk-ta/→ [nuk-ta]	61%	39%	270
Group 1 →shows high frequency of grammatical forms over 60%.			

Table 4.2 Continued-

Target Verb [Grammatical form]	Grammatical (%)	Ungrammatical (%)	Total N
/yalp-ta/→ [yal-ta]	56%	44%	269
/ilk-ta/→ [ik-ta]	54%	46%	269
/malk-ta/→ [mak-ta]	53%	47%	269
/palk-ta/→ [pak-ta]	52%	48%	270
/nalk-ta/→ [nak-ta]	51%	49%	269
Group 2 → shows similar ratio between the grammatical and ungrammatical forms between 50~59%.			
/ttelp-ta/→ [ttel-ta]	47%	53%	215
/mwulk-ta/→[mwuk-ta]	42%	58%	215
/ulp^h-ta/→ [up-ta]	30%	70%	215
/palp-ta/→ [pap-ta]	12%	88%	269
Group 3 →shows high frequency of ungrammatical forms under 50%.			

From Table 4.2, two points become evident: in most of the target predicates, great variation is apparent, and the pattern of the variation in each predicate is different from word to word, from more likely produced as a grammatical form to more likely to be produced as an ungrammatical form. Based on Table 4.2, the pattern of each predicate can be classified into three groups. The first group is the case in which their phonetic forms are more likely to be pronounced in a prescriptively grammatical way: /halt^h-ta/→[hal-ta], /hwult^h-ta/→ [hwul-ta], /ccalp-ta/→[ccal-ta], /nelp-ta/→ [nel-ta], /nulk-ta/→ [nuk-ta]. In these words, the relative frequency of the grammatical form is more

than 60%. The second group includes the following words: /yalp-ta/→ [yal-ta], /ilk-ta/→ [ik-ta], /malk-ta/→ [mak-ta], /palk-ta/→ [pak-ta], and /nalk-ta/→ [nak-ta]. In this group, the ratio between the grammatical and the ungrammatical forms was very close; therefore, the degree of variation was considered to be the most significant among the predicates. Finally, the third group includes the forms for which the dominant phonetic forms were found to violate the prescriptive norm: /ulp^h-ta/→ [up-ta], /palp-ta/→ [pap-ta], /mwulk-ta/→ [mwuk-ta], and /ttelp-ta/ → [ttel-ta]. In these words, the relative frequency of the grammatical forms was less than 50%. The frequencies of the three different outcomes for each predicate are summarized in Table 4.3.

Table 4.3 The relative frequency of each phonetic form of the predicates before a consonant for all four tasks (the bold faced are prescriptively grammatical forms).

Target words	Outcomes			
	1st segment realization	2nd segment realization	Both segments Realization	Total
halt^h-ta	96% **[hal-ta]**	3% [hat-ta]	1% [halt-ta]	269
hwult^h-ta	81% **[hwul-ta]**	19% [hwut-ta]	0% [hwult-ta]	269
ccalp-ta	66% **[ccal-ta]**	3%[ccap-ta]	31[ccalp-ta]%	269
nelp-ta	66% **[nel-ta]**	5% [nep-ta]	29%[nelp-ta]	269
nulk-ta	76% [nul-ta]	23% **[nuk-ta]**	1%[nulk-ta]	270
Group 1→ shows high frequency of the grammatical forms.				

Table 4.3 Continued-

Target words	Outcomes			
	1st segment realization	2nd segment realization	Both segments Realization	Total
yalp-ta	56% **[yal-ta]**	9%[yap-ta]	35% [yalp-ta]	269
ilk-ta	81%[il-ta]	16% **[ik-ta]**	3%[ilk-ta]	269
malk-ta	85%[mal-ta]	14% **[mak-ta]**	1%[malk-ta]	269
palk-ta	87% [pal-ta]	12% **[pak-ta]**	1%[palk-ta]	270
nalk-ta	83%[nal-ta]	14% **[nak-ta]**	3% [nalk-ta]	269
Group 2 → shows similar ratio between the grammatical vs. the ungrammatical form.				
ttelp-ta	53% **[ttel-ta]**	3% [ttep-ta]	44%[ttelp-ta]	215
mwulk-ta	77% [mwul-ta]	21% **[mwuk-ta]**	2%[mwulk-ta]	215
ulp^h-ta	33% [ul-ta]	30% **[up-ta]**	37%[ulp-ta]	215
palp-ta	67%[pal-ta]	12% **[pap-ta]**	21% [palp-ta]	216
Group 3→ shows high frequency of the ungrammatical forms.				

According to Table 4.3, within the first group, the words /halt^h-ta/, and /hwult^h-ta/

showed a high preference for the prescriptively correct form, [hal-ta] and [hwul-ta]

respectively, and this result suggests that in the /lt^h/ coda cluster, the segment /l/ is

preferred to /t^h/. As a matter of fact, throughout the previous studies of CCS, /lt^h/ coda

cluster has been assumed to be the only case that causes no variation. Even at the

regional dialect level, variation has not been manifested in /lt^h/ coda clusters. Therefore,

the forms [hal-ta] and [hwul-ta] have been considered as the only possible phonetic

forms not only from an empirical sense but also from a theoretical perspective. The results of this experiment partially support the assumption of the previous studies. However, in addition to the prescriptively grammatical forms [hwul-ta] and [hal-ta], variable forms such as [hat-ta] (3%) and [hwut-ta] (19%) were also seen, although their frequencies were very low. The finding of the two forms suggests that not only the segment /l/, but also the segment /t^h/ ([t] after neutralization) is a possible phonetic outcome in the /lt^h/ coda cluster. With relation to the theoretical exploration of CCS, this result proposes an important point about the properties of codas in Korean since in most of the previous phonological theory-based CCS studies, the segment /l/ has been assumed to be the only possible phonetic outcome in the /lt^h/ coda cluster. In other words, with relation to theoretical development of CCS, /t/ also should be included as possible outcomes.

Another noticeable result in the first group is that in the cases of /ccalp-ta/ and /nelp-ta/, both members of the cluster were frequently produced: [ccalp-ta]→ 31% and [nelp-ta] → 29%. In fact, throughout the target predicates, there seemed to be a strong tendency to pronounce both members of the cluster when they were /lp/ coda cluster words. In /yalp-ta/, /ttelp-ta/, /palp-ta/ and /ulp^h-ta/, both members of the cluster also tended to be produced. Providing two consonants in coda positions has been claimed to be very hard and unusual (Lee 1980); therefore, in most of the previous CCS studies, outcomes such as [ccalp-ta] and [nelp-ta] have not even been considered as possible outcomes. However, the results of the experiment suggest that this is not always the

case. In /nelp-ta/ and /ccalp-ta/, [nel-ta] and [ccal-ta] are respectively produced as the dominant phonetic forms.

In the second group, except for /yalp-ta/, all the other predicates were from /lk/ coda cluster. When each predicate in this group was closely examined, the predicates having /lk/ coda cluster showed a strong preference for /l/ realization regarding their phonetic outcomes: /ilk-ta/→[il-ta] (81%), /malk-ta/→ [mal-ta] (85%), /palk-ta/→[pal-ta] (87%), and /nalk-ta/ →[nal-ta] (83%). The findings contradict prescriptive grammar, which defines [-k-CV] forms are correct outcomes for /-lk/ cluster (except when the clusters are followed by the consonant 'k', in this case [-l-CV] forms are grammatical). However, as the frequency of each [-l-CV] form indicates, in /-lk/ cluster, [-l-CV] forms are too frequent to be ignored simply as minor variants in addition to the observed variation, some kind of language change is strongly suspected in /lk/ cluster. The target word /yalp-ta/, the only /lp/ cluster in the second group, was produced by all three possible phonetic forms: [yal-ta], [yap-ta], and [yalp-ta]. Among those, [yal-ta] was the most frequent form (56%), and the next was [yalp-ta] form (35%), and the least frequent form was [yap-ta] (9%). As mentioned earlier, in /lp/ cluster, both consonants were produced with relatively higher frequency than in the other clusters, and this was a somewhat unexpected result.

In the third group, /ulp^h-ta/ and /palp-ta/ showed a higher degree of deviation from the prescriptively grammatical form (more than 70%). The prescriptively anticipated forms are [up-ta] and [pap-ta]. The prescriptive grammar treats /ulp^h-ta/ and /palp-ta/ differently from the rest of the /lp/ cluster words by defining these two words'

output forms as [up-ta] and [pap-ta] respectively; except for these two words, all the other /lp/ cluster words' prescriptively grammatical forms are defined as [-l-CV] forms. This is somehow an inconsistent aspect of the prescriptive grammar, which suggests that even the prescriptive norm includes some degree of variability. As for /ulp^h-ta/, the first member of the cluster ([ul-ta]) was produced 33% of the time; the case that both segments of the cluster ([ulp-ta]) were produced appeared 37% of the time. The word /palp-ta/ also showed two variable forms, [pal-ta] (67%) and [palp-ta] (21%), both of which prescriptively ungrammatical. The prescriptively correct form [pap-ta] was produced a mere 12%.

When the predicate coda clusters are followed by a vowel, as the prescriptive grammar describes, the second consonant of the cluster is resyllabified as the onset of the following syllable. As Table 4.1 indicates, in the predicates, most of the cases coincided with the forms predicted by the prescriptive grammar: 98% of the productions was grammatical. However, in the case of nouns, resyllabification showed a high degree of variability: grammatical: 53% vs. ungrammatical 47%. Therefore, in the following, the cases of nouns were more closely examined with relation to the resyllabification.

When the results of the nouns were considered, the degree of deviation from the prescriptively grammatical norm was different depending on each noun.

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Table 4.4 The relative frequencies of grammatical vs. ungrammatical form
productions of the nouns before a vowel for all four tasks.

Target Noun [prescriptively grammatical form]	Grammatical (%)	Ungrammatical (%)	Total N
/tols+V/→ [to-lV]	99%	1%	216
/salm+ V/→ [sal-mV]	88%	12%	162
/kaps+V/→ [kap-sV]	73%	27%	216
/neks+V/→ [nek-sV]	73%	27%	216
/saks+V/→ [sak-sV]	25%	75%	162
/hulk+V/→ [hul-kV]	21%	79%	216
/talk+V/→ [tal-kV]	21%	79%	162
/yeotelp+V/→ [yeotel-pV]	21%	79%	216
Total	837 (n)	729 (n)	1566

As shown in Table 4.4, when the nouns such as *tols, salm, kaps,* and *neks* were followed

by a vowel, they were produced more frequently according to the prescriptive norm by

syllabifying both members of the cluster. Although there were still differences among

these four nouns in frequencies, their behaviors were clearly distinguished from the

other four nouns, *saks, hulk, talk,* and *yeotelp,* which did not follow the prescriptive

grammar. In these nouns, one member of the clusters, either the first or the second

consonant, was frequently deleted: /saks+i/ →[sa-ki] (75%), /hulk+i/→[hu-ki] (79%) ,

/talk+i/ →[ta-ki] (79%), and /yeotelp+i/ →[yeote-li] (79%). The results presented in

Table 4.4 suggest that not only the lexical category, but also each single item itself, causes differences regarding the degree of the variation.

4.2.2 Following segment types

In addition to vowel versus consonant, two other segment types, velar (k) versus alveolar (t), were examined as possible linguistic factors causing the variation[8]. Since before a consonant, the nouns typically do not show variation, only the predicates were closely examined here. The results are presented in Table 4.5.

Table 4.5 The relative frequencies of grammatical vs. ungrammatical form productions of the predicates depending on the following segment types: before the consonant 'k'and the consonant 't.'

Segment type	Grammatical (%)	Ungrammatical (%)	Total N
t (alveolar)	42%	58%	2268
k (velar)	82%	18%	1338
Total N	2046(n)	1560(n)	3606

Table 4.5 shows that the target predicates tend to be produced more prescriptively grammatically before the consonant /k/ than the consonant /t/. One of the reasons that /k/ resulted in more grammatical forms than /t/ is assumed to be the role of /lk/ cluster. According to the prescriptive grammar, before the consonant /k/, the predicted outputs for /lk/ cluster predicates are [-l-CV] forms. More specifically, according to the prescriptive grammar, the right outcomes for /lk/ cluster predicates are as follows:

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[8] The reason that only 't' and 'k' are considered as possible factors is that these two consonants occur commonly with the target words, and in some of the previous CCS studies (Hong 1991) the fact that variation occurs depending on these two consonants has been suggested.

/palk-ko/→[pal-ko], /nulk-ko/→[nul-ko], /ilk-ko/→[il-ko], and /malk-ko/→[mal-ko]. It

seems to be that while the prescriptive grammar distinguishes the following segment

types with relation to each predicate's production, the subjects in this experiment

mostly do not distinguish the two consonants ('k' and 't') in their production. In other

words, regardless following segment types, the subjects produced [-l-CV] forms more

frequently than [-k-CV] forms in /lk/ cluster predicates. This is why the consonant 'k'

resulted in less ungrammaticality in the predicates.

In sum, as suggested in Hypothesis 1 and 2, two linguistic factors, lexical

category and following segment type, were shown to cause the variation in CCS in

Korean. Before a vowel only the nouns cause variation while before a consonant only

the predicates cause variation. In the case of predicates, ungrammatical forms were

produced more frequently before 't' than 'k.'

4.3. Non-linguistic Variables

Throughout the linguistic variable analysis, it was discovered that nouns and

predicates show different behaviors in their degree of variation with relation to the

following segment types. Nouns showed considerable variation before a vowel (before a

vowel predicates show almost no variation) while predicates showed considerable

variation before a consonant (before a consonant, nouns show almost no variation).

Based on this, in each non-linguistic variable analysis, the two cases of variation, 1) the

nouns before a vowel and 2) the predicates before a consonant were examined with

relation to variation in CCS in Korean.

4.3.1 Age

The subjects of this experiment were divided into five different age groups: over

fifty years old (subjects born before 1955), forties (subjects born 1956-1965), thirties

(1966-1975), twenties (1976-1985), and teenagers (subjects born after 1985). Tables 4.6

and 4.7 summarize the results of all the productions depending on the subjects' age

classification. In this case, again, the subjects' productions were evaluated in terms of

prescriptive grammaticality (or ungrammaticality) and based on the frequency of

grammaticality (or ungrammaticality), the connection between the age groups and the

variation was investigated. Table 4.6 presents the cases of the nouns before a vowel.

Table 4.6 The relative frequencies of grammatical form productions in each age group's target
noun pronunciation before a vowel for all four tasks.

Age groups	Grammatical (%)	Ungrammatical (%)	Total N
before 1955	62%	38%	145
1956-1965	58%	42%	290
1966-1975	63%	37%	319
1976-1985	47%	53%	551
after 1985	46%	54%	261
Total N	837(n)	729(n)	1566

Regarding the relative frequencies of grammaticality vs. ungrammaticality, the five age

groups showed different results. Generally speaking, in the production of nouns,

subjects over thirty years old tended to produce more grammatical forms (58-63%) than

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subjects under thirty years old (46-47%). In a Chi-square test, the difference of the

frequency between these two age groups was significant at the 95% confidence level

(df=1, χ^2 =29.9, p< .05). Once the subjects' age has been discovered to be an influential

factor in the variation of the nouns, the relationship between the ages and the variation

was examined focusing on the four nouns that exhibited the high frequency of

ungrammaticality (more than 75% in Table 4.4.): /hulk/, /talk/, /saks/, and /yeotelp/.

First of all, Table 4.7 shows the frequencies of the phonetic outputs for the noun /hulk/

(before the two vowels /i/ and /un/) classified by the age variable.

Table 4.7 The relative frequency of each phonetic form for /hulk+V (i, un) /
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [hu-li], [hu-lun]	2nd segment realization (%) [hu-ki],[hu-kun]	Both segments realization (%) [hul-ki], [hul-kun]	Total(n)
before 1955	0	65%	35%	20
1956-1965	0	63%	37%	40
1966-1975	0	62%	38%	44
1976-1985	0	93%	7%	76
after 1985	0	94%	6%	36
Total N	0 (n)	170 (n)	46 (n)	216

Before a vowel, /hulk/ was produced in two forms: i) the case that the second segment

of the cluster was pronounced [hu-ki], [hu-kun], and ii) the case that both segments of

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the cluster were pronounced [hul-ki], [hul-kun]. No form of the first segment

pronunciation, [hu-li] or [hu-lun], was attested in this experiment. As a whole, the

subjects tended to delete the first member of the cluster in /hulk+V/. Across all the age

groups, the frequency of [hul-ki] and [hul-kun] forms which are grammatical forms was

found to be less than 40%. Interestingly enough, compared to one another, the subjects

were clearly divided into two age groups: over thirty and under thirty. The under thirty

group (the teenagers & the twenties) showed a very strong preference of [hu-ki (un)]

form (more than 90%), and this preference differs from the over thirty group

significantly (df=1, χ^2 =31.4, p < .05). The same pattern as the case of /hulk+V/ was

discovered also in /talk+V/, and Table 4.8 indicates this.

Table 4.8 The relative frequency of each phonetic form for /talk+V (i, un)/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [ta-li], [ta-lun]	2nd segment realization (%) [ta-ki],[ta-kun]	Both segments realization (%) [tal-ki], [tal-kun]	Total N
before 1955	0	67%	33%	15
1956-1965	0	63%	37%	30
1966-1975	0	67%	33%	33
1976-1985	0	91%	9%	57
after 1985	0	93%	7%	27
Total N	0 (0)	128 (n)	34 (n)	162

Considering the results from Table 4.7 and 4.8, in both of the /lk/ cluster nouns, the

under thirty group seldom produced /l/ before a vowel. Since this /l/ deletion occurs

completely before a consonant in these two nouns, the resyllabification presented here

suggests a strong suspicion that the underlying form of /hulk/ and /talk/ is changing to

/huk/ and /tak/ in the younger subjects.

With relation to the phonetic productions of /saks+V/, which is another noun

that shows a high frequency of ungrammaticality, two phonetic outcomes were

observed: i) the case that the first segment of the cluster was pronounced [sa-ki], [sa-

kun], ii) the case that both segments of the cluster was pronounced [sak-si], [sak-sun].

As the /lk/ cluster nouns, in /saks+V/ also, regardless of the subjects' ages the dominant

phonetic forms were prescriptively ungrammatical forms, [sa-ki] and [sa-kun] (60%-

85%). The results are represented in Table 4.9.

Table 4.9 The relative frequency of each phonetic form for /saks+V (i, un)/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [sa-ki], [sa-kun]	2nd segment realization (%) [sa-si], [sa-sun]	Both segments realization (%) [sak-si], [sak-sun]	Total N
before 1955	60%	0	40%	15
1956-1965	73%	0	27%	30
1966-1975	70%	0	30%	33
1976-1985	75%	0	25%	57
after 1985	85%	0	7%	25
Total N	120 (n)	0 (n)	40 (n)	160

When each frequency of these two phonetic forms was analyzed, the results showed a

gradual arrangement in accordance with the subject's ages: among the groups, the

youngest (teenagers) showed the strongest preference for [sa-ki] and [sa-kun], and the

oldest (over fifty) showed the least frequency of [sa-ki] and [sa-kun] forms. The

frequency of [sa-ki] and [sa-kun] in the rest of the age groups (from the twenties to

forties) was in between these two groups. Although the frequency differences suggested

in Table 4.9 were not significant in the statistical sense (df=1, χ^2 =2.70, p > .05), the

general pattern still held up the connection between the age of the subjects and the

variation.

Thus far, the degree of variation in the nouns has been found to be related to the

ages of the subjects. Basically, the younger subjects tended to produce the non-

prescriptive forms more frequently. The results for /yeotelp+V/ provided in Table 4.10

further reinforces this relationship between the variation and the ages of the subjects.

Table 4.10 The relative frequency of each phonetic form for /yeotelp+V (i, un)/ classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [yeote-li], [yeote-lun]	2nd segment realization (%) [yeote-pi], [yeote-pun]	Both segment realization (%) [yeotel-pi], [yeotel-pun]	Total
before 1955	70%	0	30%	20
1956-1965	55%	0	45%	40
1966-1975	82%	0	18%	44
1976-1985	92%	0	7%	76
after 1985	75%	0	22%	36
Total	169 (n)	0 (n)	45 (n)	214

According to Table 4.10, there was no case in which the first segment was deleted in

/yeotelp+V/: no cases such as [yeote-pi] or [yeote-pun] were found. The prescriptively

grammatical form (both segments syllabified) was the most preferred in the forties

while the form was least preferred in the twenties. As a matter of fact, subjects in their

forties showed significant difference regarding the distribution of each phonetic form

compared with the rest of the groups, except for the subjects over fifty. According to the

Chi-square test results, the forties vs. the thirties was significant (df=1, $\chi^2 = 7.05$, p<

.05), the forties vs. the twenties was significant (df=1, χ^2 =23.9, p< .05), the forties vs.

the teenagers was significant (df=1, χ^2 =4.04, p< .05). Although the variation occurred

in the form /yeotelp+V/ casts a relatively complicated pattern in the sense that the two

age groups, the over fifty and the teenagers, somewhat deviated from the general

pattern, the distribution of the two phonetic forms, [yeote-li] ([yeote-lun]) and [yeotel-

pi] ([yeotel-pun]) was still considered to be related to the ages of the subjects. In this

case, the subjects were divided into two age groups: the over forty (from 1955- 1965)

and the under forty (from 1966-after 1985). The over forty group tended to produce the

grammatical forms more frequently than the under forty group.

In the cases of the predicates, as in Table 4.11, the data display a similar pattern

with the nouns in the sense that the older subjects tend to produce prescriptively

grammatical variants more frequently. However, in this case, the ages of the subjects

were grouped differently from the nouns: the over fifty (74%) and under fifty (53%-

58%). The distribution of the grammatical forms and the variational forms was

significantly different between these two groups (df=1, χ^2 = 24.06, p < .05). The fact

that the forties and the thirties are grouped with the younger age groups (the twenties

and teenagers) was different from the nouns. This age grouping based on Table 4.11

suggests a somewhat different aspect of the variation. The range of the variation in the

predicates is broader than the nouns.

Table 4.11 The relative frequencies of grammatical vs. ungrammatical form
productions of the predicates before a consonant classified by
each age group for all four tasks.

Age groups	Grammatical (%)	Ungrammatical (%)	Total N
Before 1955	74%	26%	330
1956-1965	58%	42 %	660
1966-1975	53%	47%	726
1976-1985	54%	46%	1253
after 1985	55%	45%	583
Total N	2012 (n)	1540 (n)	3552
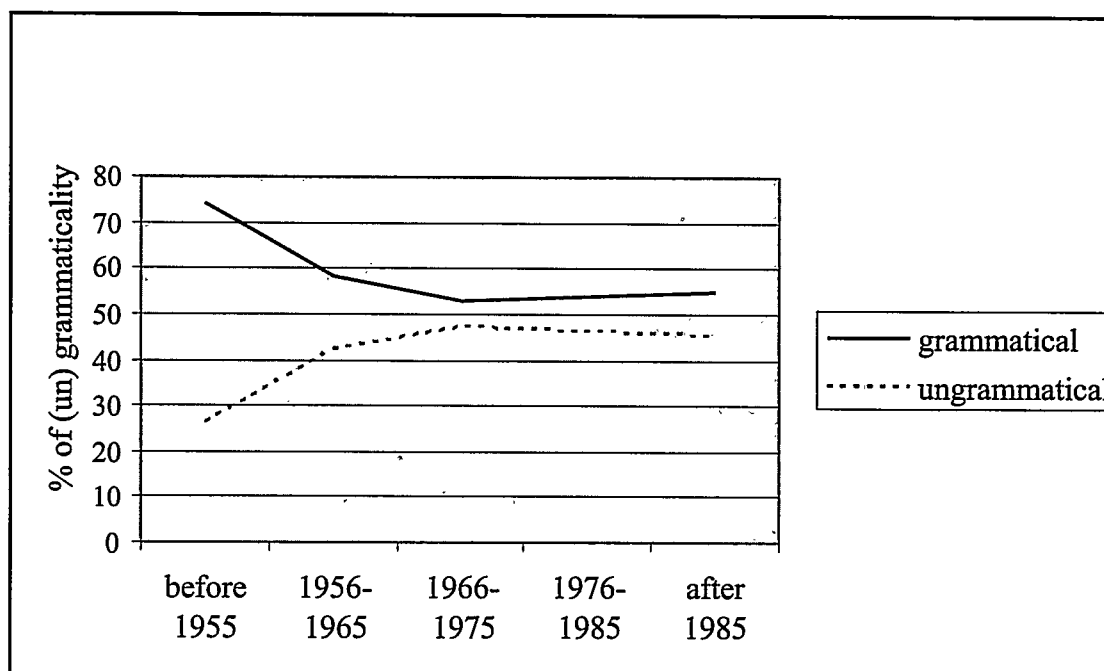
Figure 4.2 Grammatical vs. ungrammatical form productions of the predicates
before a consonant: classified by each age group

Bearing in mind the relationship between the subjects' ages and the degree of variation

(Hypothesis 3: the younger speakers tend to produce the innovative forms-[l] form in

/lk/ and /lp/ cluster predicates), the frequency of each phonetic production of the target

predicates was counted under the age group categorization. The target predicates

include a total of six /lk/ coda cluster words: *palk-ta* 'bright,' *ilk-ta* 'read' *nulk-ta* 'old,'

nalk-ta 'shabby,' *malk-ta* 'clear,' and *mwulk-ta* 'weak.' Among these predicates, first of

all, each phonetic form for /palk-ta/ was given in Table 4.12.

Table 4.12 The relative frequency of each phonetic form for /palk-ta/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [pal-ta]	2nd segment realization (%) [pak-ta]	Both segments realization (%) [palk-ta]	Total N
before 1955	56%	44%	0	25
1956-1965	84%	14%	2%	50
1966-1975	95%	5%	0	55
1976-1985	91%	8%	1%	95
after 1985	91%	9%	0	45
Total N	235 (n)	33 (n)	2 (n)	270

The predicate /palk-ta/ was produced in three ways: [pal-ta], [pak-ta] and [palk-ta]. As

Table 4.12 indicates, except for the oldest group (before 1955), the rest of the groups

showed a strong preference for the [pal-ta] form (more than 80%). In addition, the

preference was significantly different between these two groups: the fifties vs. forties was significant (df=1, χ^2 =7.94, p <.05), the fifties vs. thirties (df=1, χ^2 =17.68, p <.05) was significant, the fifties vs. the twenties was significant (df=1, χ^2 =18.53, p <.05), the fifties vs. the teenagers was significant (df=1, χ^2 =11.7, p <.05). While it is true that the oldest group tended to produce the prescriptively grammatical form more frequently than the other age groups, the frequencies in Table 4.12 suggests that the variation occurs quite frequently even in the oldest group. In fact, across all the other /lk/ cluster predicates, the same patterns were captured. More data were presented for /nulk-ta/ (Table 4.13) and /malk-ta/ (Table 4.14).

Table 4.13 The relative frequency of each phonetic form for /nulk-ta/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [nul-ta]	2nd segment realization (%) [nuk-ta]	Both segments realization (%) [nulk-ta]	Total N
before 1955	48%	52%	0	25
1956-1965	74%	26%	0	50
1966-1975	80%	20%	0	55
1976-1985	77%	20%	3%	95
after 1985	84%	16%	0	45
Total N	205 (n)	62 (n)	3 (n)	270

Table 4.14 The relative frequency of each phonetic form for /malk-ta/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [mal-ta]	2nd segment realization (%) [mak-ta]	Both segments realization (%) [malk-ta]	Total N
before 1955	64%	36%	0	25
1956-1965	82%	16%	2%	50
1966-1975	89%	11%	0	55
1976-1985	86%	12%	2%	95
after 1985	91%	10%	0	44
Total N	228 (n)	38 (n)	3 (n)	269

In the case of /lk/ cluster predicates, rather than the grammatical forms ([-k-CV]), the non-prescriptive forms ([-l-CV]) forms were strongly preferred across all over the age groups. Also, the results support the hypothesis that younger speakers tend to produce the [-l-CV] form than the older subjects. The subjects who are over fifty produced the [-k-CV] form more frequently than the younger subjects less than fifty years old.

Each phonetic form of the /lp/ cluster predicates, *palp-ta, ccalp-ta, yalp-ta, ttelp-ta, nelp-ta*, was also examined with relation to the age groups. As with the /lk/ cluster predicates, the /lp/ cluster predicates were produced in three different phonetic forms: the first segment realization ([-l-CV]), the second segment realization ([-p-CV]), and both segments realization ([-lp-CV]). When the frequencies of these forms were reviewed, as previously discussed in Table 4.3, the production of both segments in /-lp/

clusters appeared to be the second dominant form along with the first segment

pronunciation which was the most frequent form. The results from the cases of /nelp-ta/

and /ccalp-ta/ represent the general pattern in this cluster.

Table 4.15 The relative frequency of each phonetic form for /nelp-ta/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [nel-ta]	2nd segment realization (%) [nep-ta]	Both segments realization (%) [nelp-ta]	Total N
before 1955	76%	4%	20%	25
1956-1965	66%	12%	22%	50
1966-1975	60%	7%	33%	55
1976-1985	67%	1%	32%	95
after 1985	66%	5%	30%	44
Total N	178 (n)	14 (n)	77 (n)	269

Table 4.16 The relative frequency of each phonetic form for /ccalp-ta/
classified by each age group for all four tasks.

Age group	Outcomes			
	1st segment realization (%) [ccal-ta]	2nd segment realization (%) [ccap-ta]	Both segments realization (%) [ccalp-ta]	Total N
before 1955	84%	0	16%	25
1956-1965	70%	10%	20%	50
1966-1975	65%	2%	33%	55
1976-1985	61%	0	39%	95
after 1985	61%	5%	34%	44
Total N	177 (n)	8 (n)	84 (n)	269

In both tables, [-l-CV] forms were produced most frequently. In this case, the forms were most favored by the oldest group, but the frequency differences between the oldest and the rest of the groups were not statistically significant except for the case that over fifty vs. twenties in /ccalp-ta/: as for the case of /nelp-ta/, over fifty vs. forties was not significant (df=2, χ^2 =1.414, p >.05), over fifty vs. thirties was not significant (df=2, χ^2 =1.939, p >.05), over fifties vs. twenties is not significant (df=2, χ^2 =2.154, p >.05), over fifties vs. teenagers was not significant (df=2, χ^2 =0.801, p >.05), and as for the case of /ccalp-ta/, over fifty vs. forties was not significant (df=2, χ^2 =3.08, p >.05), over fifty vs. thirties was not significant (df=2, χ^2 =3.03, p >.05), over fifty vs. twenties was significant (df=1, χ^2 =4.63, p < .05), over fifty vs. teenagers was not significant (df=2, χ^2 =0.82, p > .05). Although the frequency differences discovered in /nelp-ta/ and

/ccalp-ta/ were not statistically significant, the pattern that the oldest subjects produce [-l-CV] forms with relatively high frequency appeared to be consistent in all the /lp/ cluster predicates. With relation to the hypothesis, the researcher expected that younger subjects would produce [-l-CV] forms more frequently than the older subjects, since [-l-CV] forms are innovative forms of /lk/ cluster, and were considered to be influential in pronouncing /lp/ cluster. In other words, some kind of analogical process was assumed with relation to /lp/ cluster pronunciation. However, unexpectedly, the younger subjects' productions of [-l-CV] form were discovered to be less frequent than the older subjects because of the higher frequency of cases in which both members of the cluster were realized. For the /lp/ clusters, since [l-CV] forms are defined as the prescriptively grammatical forms, the results can be interpreted as another case in which older subjects tend to be conservative in their pronunciations. In this case, [-lp-CV] forms were considered as innovative forms, and the forms tended to be produced more frequently by the younger subjects. However, for /lp/ clusters, the relationship between the variation and the age of the subjects can only be presented as a possible trend, which merits further research.

4.3.2. Gender

With relation to variation, many researchers have claimed that the gender of speakers plays a role in language variation (Labov 1972, Wolfram and Fasold 1974, Romaine 1978, Trudgill 1983). Based on the previous research, the connection between language variation and the gender of the subjects was considered. First of all, Table 4.17 presents the relative frequencies of grammatical and ungrammatical form

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productions of the nouns before a vowel based on the gender differentiation of the

subjects.

Table 4.17 The relative frequencies of grammatical vs. ungrammatical form
productions of the nouns before a vowel classified by
the subjects' gender for all four tasks.

Gender	Grammatical (%)	Ungrammatical (%)	Total N
male	51%	49%	812
female	56%	44%	754
Total N	837 (n)	729 (n)	1566

The results in Table 4.17 indicate that the female subjects produced prescriptively

grammatical forms more often than the male subjects did. Moreover, this frequency

difference between the two groups was statistically significant (df=1, χ^2 =5.7, p< .05).

To examine gender-related patterns in the nouns, each noun's phonetic form was

analyzed with relation to the gender of the subjects. According to the results, among the

eight nouns, the two nouns /salm+V/ 'life' and /yeotelp+V/ 'eight' were discovered to be

related to the gender of the subjects. The distribution of each phonetic form for

/salm+V/ is provided in Table 4.18.

Table 4.18 The relative frequency of each phonetic form for /salm+V (i, un) / classified by the gender of the subjects for all four tasks.

Gender	Outcomes			
	1st segment realization (%) [sa-li], [sa-lun]	2nd segment realization (%) [sa-mi], [sa-mun]	Both segments realization (%) [salmi], [sal-mun]	Total N
male	0	17%	83%	84
female	0	6%	94%	78
Total N	0 (n)	19 (n)	143 (n)	162

In the case of /salm+i (un)/, the two phonetic forms [sa-mi (un)] and [sal-mi (un)] were produced. Between these two forms, the form [sal-mi (un)] syllabified by both members of the coda cluster was discovered to be the dominant phonetic form in both the male and the female subjects. When data for the male and the female subjects were compared, as in Table 4.18, we found that the female subjects produced the [sal-mi (un)] form more frequently than the male subjects. Statistically, the frequency difference between the two gender groups was significant (df=1, χ^2 =4.10, p < .05).

The noun /yeotelp+V (i, un)/ was another case in which the distribution of each phonetic form was significantly different between the male and the female subjects (df=1, χ^2 =17.16, p< .05). In this case, the two phonetic forms i) the case of the first segment production ([yeote-li] and [yeote-lun]), and ii) the case of both segments production ([yeotel-pi] and [yeotel-pun]) were produced most frequently, and one case of the first segment pronunciation ([yeote-pi] and [yeote-pun]) was produced. Regarding the phonetic forms, the grammatical forms [yeotel-pi] and [yeotel-pun] were

produced more frequently by the female subjects than the male subjects. Although the

frequency of the grammatical form was relatively higher in the female speakers, in both

of the gender groups, the dominant phonetic forms were discovered to be the

ungrammatical forms, [yeote-li] and [yeote-lun]. In Table 4.19, depending on the

gender of the subjects, the frequency of each phonetic form for /yeotelp+V (i, un)/ was

provided.

Table 4.19 The relative frequency of each phonetic form for /yeotelp+ V (i, un)/
classified by the gender of the subjects for all tasks.

Gender	Outcomes			
	1st segment realization (%) [yeote-li], [yeote-lun]	2nd segment realization (%) [yeote-pi] [yeote-pun]	Both segments realization (%) [yeotel-pi] [yeotel-pun]	Total N
male	89%	0	9%	111
female	66%	1%	33%	104
Total N	169 (n)	1 (n)	45 (n)	215

Considering the results from the two nouns, /salm+V/ and /yeotelp+V/, the female

subjects seem to produce grammatical forms more frequently than the male subjects.

For all the nouns, including these two nouns, the female subjects showed a higher

preference for the prescriptively grammatical forms than the male subjects, although in

these cases, the differences between the two gender groups were not statistically

significant: /hulk+V/ (df=1, χ^2 =0.379, p > .05), /kaps+V/ (df=1, χ^2 =1.20, p > .05),

/neks+V/ (df=1, χ^2 =0.05, p > .05), /talk+V/ (df=1, χ^2 =1.03, p > .05), /tols+V/ (df=1, χ^2 =3.10, p > .05), /saks+V/ (df=1, χ^2 =0.53, p > .05).

While in the nouns (before a vowel) the variation is a matter of deleting a segment or not-once deletion occurs, deleted segments are predictable, in the predicates (before a consonant) rather than deletion itself, the variation is caused by different segmental selection regarding the coda clusters. Actually, in the predicates, to produce both of the consonants in coda clusters is not only ungrammatical but also uncommon: one member of the cluster is supposed to be deleted. Therefore, with relation to the gender of the subjects, the variation in the predicates was focused on the hypothesis that there are different preferences for choosing a segment from coda clusters. Hypothesis 3 states that female speakers tend to produce the innovative (non-prescriptive) forms more frequently than male speakers. For example, the words such as /ilk-ta/ 'read' and /palk-ta/ 'bright' from /lk/ cluster were expected to be produced as [il-ta] and [pal-ta] (which are innovative forms) respectively more frequently by the female speakers than the male speakers. Above of all, each gender group's degree of grammaticality is provided in Table 4.20.

Table 4.20 The relative frequencies of grammatical vs. ungrammatical form
productions of the predicates before a consonant classified by
the gender of the subjects for all four tasks.

Gender	Grammatical (%)	Ungrammatical (%)	Total N
male	57%	43%	1848
female	57%	43%	1705
Total N	2013 (n)	1540 (n)	3553

Behaving differently from the nouns, overall grammaticality in the predicates was

discovered to be the same between the male and female subjects. When the target

predicates were investigated individually, the frequencies of their phonetic forms did

not show any significant gender differences. In the beginning, as stated in Hypothesis 3,

gender difference in CCS had been suspected. In particular, in the /lk/ and/ lp/ cluster

predicates, it was initially assumed to be that the female subjects would produce [-l-CV]

forms more frequently. However, in both of the gender groups, [-l-CV] forms occurred

with a similar rate. There was no case in which the female subjects showed more

significant frequency in [-l-CV] forms. The results from the two predicates, /ilk-ta/ and

/palp-ta/, are given in Table 4. 21 and 4.22.

Table 4.21 The relative frequency of each phonetic form for /ilk-ta/
classified by the gender of the subjects for all four tasks.

Gender	Outcomes			
	1st segment realization (%) [il-ta]	2nd segment realization (%) [ik-ta]	Both segments realization (%) [ilk-ta]	Total N
male	84%	13%	3%	140
female	78%	20%	2%	129
Total N	218 (n)	44 (n)	7 (n)	269

Table 4.22 The relative frequency of each phonetic form for /palp-ta/
classified by the gender of the subjects for all four tasks.

Gender	Outcomes			
	1st segment realization (%) [pal-ta]	2nd segment realization (%) [pap-ta]	Both segments realization (%) [palp-ta]	Total N
male	68%	13%	19%	112
female	66%	10%	24%	104
Total N	145 (n)	25 (n)	46 (n)	216

Not only in these two predicates but also in the rest of the predicates, a similar pattern

was detected. The distribution of each phonetic form for the predicates did not show

any relationship with the gender of the subjects, and Table 4.23 summarizes the results.

Table 4.23 Summary of the relative frequency of each phonetic form of the predicates classified by the gender of the subjects for all four tasks.

Target Predicates	Male (%)	Female (%)	Total N
/palk-ta/ 'bright'	[pal-ta] (90%) [pak-ta] (9%) [palk-ta] (1%) (n=140)	[pal-ta] (84%) [pak-ta] (15%) [palk-ta] (1%) (n=130)	270
/ccalp-ta/ 'short'	[ccal-ta] (66%) [ccap-ta] (5%) [ccalp-ta] (29%) (n=140)	[ccal-ta] (65%) [ccap-ta] (1%) [ccalp-ta] (34%) (n=129)	269
/nulk-ta/ 'old'	[nul-ta] (74%) [nuk-ta] (25%) [nulk-ta] (1%) (n=140)	[nul-ta] (79%) [nuk-ta] (20%) [nulk-ta] (1%) (n=130)	270
/nelp-ta/ 'wide'	[nel-ta] (65%) [nep-ta] (8%) [nelp-ta] (27%) (n=140)	[nel-ta] (67%) [nep-ta] (2%) [nelp-ta] (30%) (n=129)	269
/malk-ta/ 'clear'	[mal-ta] (85%) [mak-ta] (13%) [malk-ta] (2%) (n=140)	[mal-ta] (85%) [mak-ta] (14%) [malk-ta] (1%) (n=129)	269
/nalk-ta/ 'shabby'	[nal-ta] (85%) [nak-ta] (12%) [nalk-ta] (3%) (n=140)	[nal-ta] (81%) [nak-ta] (16%) [nalk-ta] (3%) (n=129)	269

Table 4.23 - Continued

Target Predicates	Male (%)	Female (%)	Total N
/hwult^h-ta/ 'heckle'	[hwul-ta] (82%) [hwut-ta] (18%) [hwult-ta] (0%) (n=140)	[hwul-ta] (81%) [hwut-ta] (19%) [hwult-ta] (0%) (n=129)	269
/ttelp-ta/ 'astringent'	[ttel-ta] (51%) [ttep-ta] (6%) [ttelp-ta] (43%) (n= 112)	[ttel-ta] (54%) [ttep-ta] (1%) [ttelp-ta] (45%) (n= 103)	215
/yalp-ta/ 'thin'	[yal-ta] (56%) [yap-ta] (11%) [yalp-ta] (32%) (n=140)	[yal-ta] (57%) [yap-ta] (6%) [yalp-ta] (37%) (n=129)	269
/mwulk-ta/ 'weak'	[mwul-ta] (73%) [mwuk-ta] (24%) [mwulk-ta] (3%) (n=112)	[mwul-ta] (82%) [mwuk-ta] (16%) [mwulk-ta] (2%) (n=103)	215
/ulp^h-ta/ 'recite'	[ul-ta] (29%) [up-ta] (33%) [ulp-ta] (38%) (n=112)	[ul-ta] (37%) [up-ta] (27%) [ulp-ta] (36%) (n=103)	215

4.3.3 Educational Level

As for level of education, the subjects were divided into four groups, depending on the institutional education that the subjects completed: middle school graduate, high school graduate, college graduate, and graduate school level. Based on this

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classification system, the grammaticality and the ungrammaticality of the target words

were examined. Table 4.24 and 4.25 present the results.

Table 4.24 The relative frequencies of grammatical vs. ungrammatical form productions
of the nouns before a vowel classified by the level of education of the subjects for all
four tasks.

Education	Grammatical (%)	Ungrammatical (%)	Total N
graduate school	62%	38%	87
college	56%	44%	580
high school	51%	49%	609
middle school	50%	50 %	290
Total N	837 (n)	729 (n)	1566

Table 4.25 The relative frequencies of grammatical vs. ungrammatical form productions
of the predicates before a consonant classified by the level of education of the subjects
for all four tasks.

Education	Grammatical (%)	Ungrammatical (%)	Total N
graduate school	57%	43%	198
college	57%	43%	1320
high school	57%	43%	1722
middle school	56%	43 %	649
Total N	2013 (n)	1540 (n)	3553

The frequency tables provided here suggest that there was no relationship between the

educational level and the variation in CCS. In both the nouns and the predicates, each

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group classified by educational level showed very similar (even exactly same frequencies of the grammaticality among the groups in the predicates) degrees of grammaticality. The results of the Chi-square test provide that in both nouns (before a vowel) and predicates the frequencies of grammatical form productions were not different significantly in statistical sense among the level of education (nouns before a vowel: df=3, χ^2=6.96, p> .05, predicates before a consonant : df=3, χ^2=0.127, p> .05).

In Hypothesis 5 (education level and the variation), this research suggested that there would be a difference between highly educated speakers and lower educated speakers in producing prescriptively grammatical forms or ungrammatical forms of the target words. Prescriptively grammatical forms were assumed to be favored by highly educated speakers since institutional education has been considered as a system enforcing standard norm with relation to linguistic patterns. In addition, lower educated speakers' preference for the innovative (ungrammatical) forms was suggested by referring the correlationship between education level and social status. According to the results, however, the subjects' educational level was discovered not to be related to the patterns of the variation.

4.3.4 Register

Lastly, the subjects' productions were investigated with respect to variation across four different speech styles: casual, narrative text reading, short sentence reading, and word list reading. Recall that these styles were intended to reflect the subjects'

degree of carefulness or consciousness while speaking, which may be a factor causing

the variation. First of all, the results for the nouns are provided in Table 4.26.

Table 4.26 The relative frequencies of grammatical vs. ungrammatical form productions of the nouns before a vowel during each task.

Register	Grammatical (%)	Ungrammatical (%)	Total N
casual	38%	62%	432
text	62%	39%	270
sentence	55%	45%	432
word list	61%	39 %	432
Total N	837 (n)	729 (n)	1566

The results of the analysis suggest that in the case of nouns, the casual style makes a

significant difference from the rest of the styles with relation to overall grammaticality:

the casual vs. the text reading was significant (df=1 χ^2 = 37.7, p < .05), the casual vs.

the sentence reading was significant (df=1 χ^2=24.1, p< .05), the casual vs. the word list

reading was significant (df= 1, χ^2=45.3, p< .05) statistically. While the casual style

manifested a significant difference from all the other styles, the rest of the styles did not

exhibit any statistically significant differences among each other: text vs. sentence

reading was not significant (df=1, χ^2 = 3.46, p > .05), text vs. word list reading was not

significant (df=1, χ^2 = 0.05, p > .05), sentence reading vs. word list reading was not

significant (df=1, χ^2 = 3.46, p > .05). In other words, only the casual speech was

distinguished from the other styles. Based on this, each noun's individual phonetic form

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was analyzed with reference to its frequency, and some examples that cast interesting

points are represented here.

Table 4.27 The relative frequency of each phonetic form for /hulk+V (i, un)/
classified by each register.

Register	Outcomes			
	1st segment realization (%) [hu-li], [hu-lun]	2nd segment realization (%) [hu-ki], [hu-kun]	Both segments realization (%) [hul-ki], [hul-kun]	Total N
casual	0	100%	0	54
text	0	72%	28%	54
sentence	0	76%	24%	54
word list	0	67%	33%	54
Total N	0 (n)	170 (n)	46 (n)	216

Table 4.27 gives the frequency of each phonetic form for the noun /hulk/. Surprisingly,

all the subjects produced [hu-ki] and [hu-kun] (ungrammatical forms) in the causal

environment, and this result makes a clear distinction from the rest of the styles. The

same result occurred in the noun /talk/. In the casual style, the forms that syllabify the

second segment of the cluster [ta-ki] and [ta-kun], which are ungrammatical forms,

were produced most frequently ([ta-ki] and [ta-kun] →98%, [tal-ki] and [tal-kun]

→2%). However, in the word list reading, the frequency of grammatical forms [tal-ki]

and [tal-kun] was much higher than as in the casual style ([tal-ki] and [tal-kun]→ 44%,

[ta-ki] and [ta-kun] → 56%). From the results discussed so far, stylistic variation in the

/lk/ cluster nouns can be supported, and in this case, the significance resulted from the casual versus the non-casual (referring to the rest of the styles) comparison. Including the /lk/ cluster nouns, the rest of the target nouns also showed the same sort of stylistic variation. Some of these forms were presented in Table 4.28-4.30. As the tables indicate, the ungrammatical forms [ne-ki], [ne-kun], [ka-pi], [ka-pun], [sa-ki], and [sa-kun] showed the highest frequencies in the casual style, and statistically, the frequencies were not all but mostly distinguished from the rest of the styles. The results of the statistical test are summarized in Table 4.31.

Table 4.28 The relative frequency of each phonetic form for /neks+V(i, un)/ classified by each register.

Register	Outcomes			
	1st segment realization (%) [ne-ki], [ne-kun]	2nd segment realization (%) [ne-si], [ne-sun]	Both segments realization (%) [nek-si], [nek-sun]	Total N
casual	52%	0	48%	54
text	17%	0	83%	53
sentence	22%	0	78%	54
word list	17%	0	82%	53
Total N	58 (n)	0 (n)	156 (n)	214

Table 4.29 The relative frequency of each phonetic form for /kaps+V (i, un)/
classified by each register.

Register	Outcomes			
	1st segment realization (%) [ka-pi], [ka-pun]	2nd segment realization (%) [ka-si], [ka-sun]	Both segments realization (%) [kap-si], [kap-sun]	Total N
casual	39%	0	61%	54
text	19%	0	81%	54
sentence	24%	0	76%	54
word list	28%	0	72%	54
Total N	59 (n)	0 (n)	157 (n)	216

Table 4.30 The relative frequency of each phonetic form for /saks+V (i, un)/
classified by each register.

Register	Outcomes			
	1st segment realization (%) [sa-ki], [sa-kun]	2nd segment realization (%) [sa-si], [sa-sun]	Both segments realization (%) [sak-si], [sak-sun]	Total N
casual	85%	0	15%	54
sentence	72%	0	28%	54
word list	65%	0	35 %	54
Total N	120 (n)	0 (n)	42 (n)	162

Table 4.31 Summary of chi-square test results for /neks+V/, /kaps+V/, /saks+V/ classified by each register.

Register	Chi-square test results		
	/neks+V/	/kaps+V/,	/saks+V/
casual vs. text	df=1, χ^2 = 14.8, p < .05 (**significant**)	df=1, χ^2 = 5.47, p < .05 (**significant**)	No data
casual vs. sentence	df=1, χ^2 = 10. 1, p < .05 (**significant**)	df=1, χ^2 = 2.74 p > .05 (not significant)	df=1, χ^2 = 2.20, p > .05 (not significant)
casual vs. word list	df=1, χ^2 = 14.3 p < .05 (**significant**)	df=1, χ^2 = 1.5 p > .05 (not significant)	df=1, χ^2 = 5.33 p < .05 (**significant**)

In general, these nouns are also considered to be in the same patterns as the /lk/ cluster nouns: ungrammatical forms were produced most frequently in the casual style and grammatical forms tended to be produced with relatively higher frequency in the word list reading than the casual style ([sa-mi] and [sa-mun] for /salm+V/ is also included in this pattern).

In the case of /yeotelp+V/, although the stylistic variation was not statistically significant in each comparison (casual vs. text reading: df=1, $\chi2$ = 0.31, p > .05, casual vs. sentence reading: df=1, $\chi2$ =0.57, p > .05, casual vs. word list reading: df=1, $\chi2$ = 3.63, p > .05), the distribution of its phonetic form generally followed the pattern suggested here: the prescriptively grammatical forms were most frequent in the word list reading and ungrammatical forms were most frequent in the casual style.

Regarding stylistic variation in the predicates, the text reading style was excluded to prevent the influence of the following segment type. In the text reading, most of the phonological forms of the predicates were '–ko' form because of the consideration of structural naturalness. Since it is very formal to produce '–ta' form (e.g. *palk-ta* 'bright,' *nelp-ta* 'wide' and so on), for the purpose of more naturalness of the text, '-ta' forms were excluded in the text reading task. As discussed earlier, depending on the following segment type, whether 't' or 'k,' the variation in the predicates occurred differently: before 't,' the predicates showed more variation. Therefore, it seemed to be reasonable to exclude the text reading in which the predicates were designed to be '–ko' forms, and only the three styles- casual, sentence reading, and word list reading were considered. The Table 4.32 shows overall grammaticality for the predicates with relation to the styles.

Table 4.32 The relative frequencies of grammatical vs. ungrammatical form productions of the predicates before a consonant during each task.

Register	Grammatical (%)	Ungrammatical (%)	Total N
casual	44%	56%	756
sentence	41%	59%	756
word list	40%	60 %	756
Total N	948 (n)	1320 (n)	2268

In contrast with the stylistic variation observed in the nouns, the grammatical forms for the predicates were equally distributed regardless of the styles. Any pair of stylistic

comparisons made no significant difference regarding its distribution of the grammatical forms. Given this fact, each individual predicate's phonetic form was reviewed based on the stylistic classification. Although this research highly suspected stylistic variation in the predicates, especially in /lp/ and /lk/ clusters, no predicates showed any connection with the styles. One thing that somewhat consistently occurred in the predicates was that in /lp/ cluster the frequency of both segments pronunciation was higher in the word list reading than the casual although this was not statistically significant at the 95% confidence level.

Table 4.33 The relative frequency of each phonetic form of the /lp/ cluster predicates before a consonant during the casual and word list reading tasks.

Register		Outcomes			
		1st segment realization (%) [CVl-ta]	2nd segment realization (%) [CVp-ta]	Both segments realization (%) [CVlp-ta]	Total N
palp-ta	Casual	61%	13%	15%	54
	W/R	63%	7%	24%	54
ccalp-ta	Casual	65%	2%	32%	54
	W/R	46%	2%	52%	54
yalp-ta	Casual	48%	6%	46%	54
	W/R	40%	8%	51%	54
ttelp-ta	Casual	56%	4%	40%	54
	W/R	39%	6%	57%	54
nelp-ta	Casual	53%	7%	30%	54
	W/R	46%	11%	43%	54

As Table 4.31 indicates, with respect to the /lp/ cluster predicates, the subjects tended to pronounce both of the consonants in the word list reading style rather than in the casual speech style. Since according to the prescriptive grammar, complex coda pronunciation is assumed to be ungrammatical, this result suggests very the unusual conception that the subjects tend to produce ungrammatical forms more frequently in the formal style than in the casual. This was an unlikely expected result. However, considering the fact that complex coda pronunciation is highly faithful to the input form, since no deletion occurs, some kind of the subject's 'hyper-correction' seemed to cause the frequent complex coda pronunciation in the careful speech of the predicates. The subjects read what they saw. Most of them read the target words very carefully in the reading test. In fact, in his optimality theoretic analysis of style level and pronunciation in French (liaison), Dutch (vowel reduction), and Turkish (vowel epenthesis), Van Oostendorp suggests some kind of universal constraint that 'the more formal style of speech, the closer the pronunciation to the spelling' (1997:225). According to him, in such languages as French, Dutch, Turkish and Korean in which orthography reflects the underlying form of a word, spelling pronunciation become apparent in accordance with stylistic formality of speech. In this case, the faithfulness constraint, which pursues 'input-output correspondence,' is highly ranked. In this research, based on the Oostendorp's claim, the subjects' spelling pronunciation in formal styles can be explained in terms of interaction between style level and faithfulness constraint. It is to such notions of "faithfulness" that we how turn.

4.4 Summary of the Results

The results of the data analysis presented in this chapter showed that most of the suggested factors (except for the educational level of subjects) play roles in causing variation in CCS. Furthermore, in most of cases, the degree of variation was discovered to be statistically significant. Table 4.34 summarizes the results.

Table 4.34 The summary of the results

	Variable factors	Variation depending on the factor	Statistical significance
linguistic	lexical category	**yes**; variation occurs depending on the lexical category of the target words.	noun vs. predicates → **significant**
	following segment (vowel vs. consonant 'k' vs. 't')	**yes**; variation occurs depending on following segment type.	i) vowel vs. consonant → **significant** ii) 'k' vs. 't' → **significant**
non-linguistic	age	**yes**; variation occurs depending on the age of the subjects.	i) over thirty vs. under thirty (in the nouns) → **significant** ii) over fifty vs. under fifty (in the predicates) → **significant**
	gender	**yes**; variation occurs depending on the gender of the subjects.	male vs. female (in the nouns) → **significant**
	educational level	**no**; variation is not caused by the educational level of the subjects	
	register	**yes**; variation occurs depending on the register.	casual vs. non-casual → **significant**

CHAPTER 5

THEORETICAL IMPLICATIONS

5.1 Introduction

Thus far in this dissertation, the variation in the cluster coda words has been discussed from an empirical perspective. In this chapter, based on the results of the experiment, larger implications of this research are explored in terms of linguistic theory: Optimality Theory.

5.2 Optimality Theory

According to Optimality Theory (OT) originally proposed by Prince and Smolensky (1993) and Prince and McCarthy (1994), there is a set of universal constraints that every language shares. These constraints are not only violable but also different in their rankings from language to language. Therefore, the wide range of structural variability across languages results from the different rankings of these constraints in each language. For example, while every language has onset and coda constraints in its syllable structure, the observed differences in the syllables among languages result from the different rankings of these universal syllable structure constraints. Where an onset constraint is highly ranked, languages prefer to have onsets in their syllables, while certain languages prefer to have coda in their syllables, where a coda constraint is highly ranked.

The basic mechanism of OT can be summarized as two basic terms: GEN (generator) and EVAL (evaluation). The role of GEN is to generate potential candidates for output based on the input. In this case, GEN is assumed to create the candidates in linguistically reasonable manner. The role of EVAL is to evaluate the candidates created by GEN. Based on a hierarchical constraint system, EVAL selects the best optimal candidate. Figure 5.1 schemtizes the selection of the optimal candidate for /xat-en/ from Yawelmani.

Input: /xat-en/

GEN

Candidate sets: xa·te·n   xa·te·n   xa·ten ne·tax a·ha   .....etc

EVAL   (constraints)
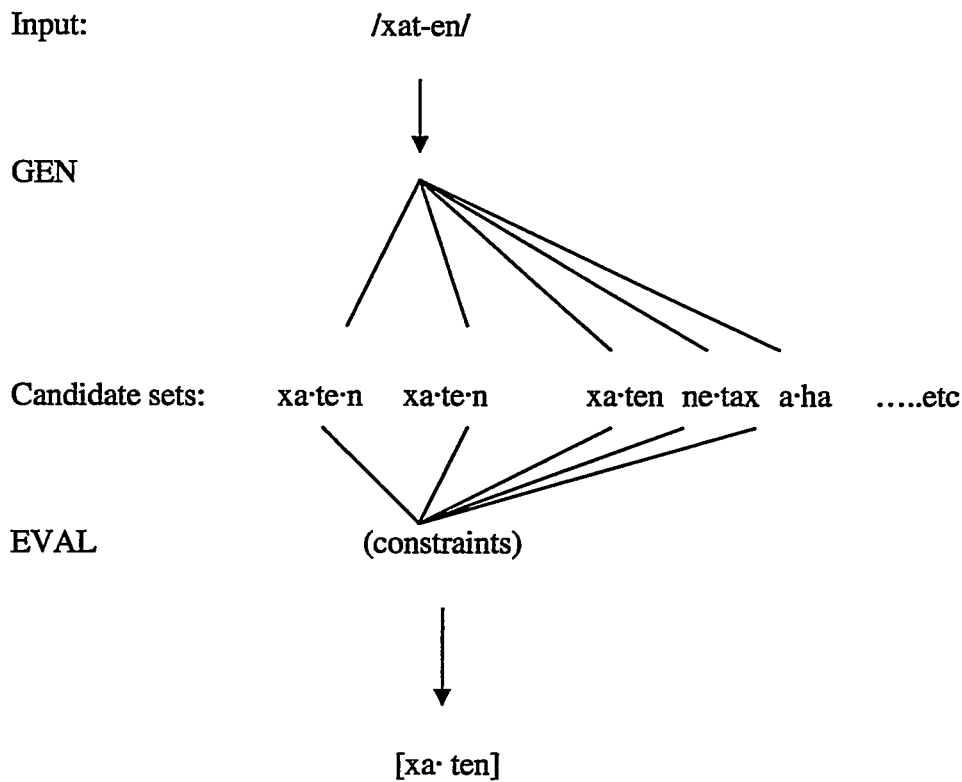
                         [xa· ten]

Figure 5.1 A Schematic of OT (Archangeli 1997:14)

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The example illustrated in Figure 5.1 provides how the final syllabification is selected. First, based on the input form, /xat-en/, GEN creates candidates, such as *xa·te·n, xa·te·ni, xa·ten, ne·tax*. Basically, potential candidates are supposed to be faithful to the input form, but this faithfulness, as already mentioned, is also a type of constraint that is violable. In fact, the faithfulness to the input is a relative or preferred concept rather than an absolute one. Therefore, for any language that ranks faithfulness constraints highly, the candidate such as *xa·te·ni, ne·tax* cannot be the final form since both of them are not faithful to their input segments: for example, *xateni* has an epenthesized vowel that does not appear in the input. By means of constraints during EVAL process, the output [xa ·ten] is selected as the final output. Considering the input and the output together, a couple of constraints such as faithfulness and onset are assumed to be highly ranked constraints since the output is faithful to the input (no deletion and epentheses) and the candidate with two syllable onsets is preferred.

One of the major tasks of constraints-based approach is to define constraints from a language universal perspective. Therefore, in the following section, each constraint already, developed in terms of language universal constraints, is discussed with relation to CCS in Korean.

<div align="center">5.3 CCS Analysis within Optimality Theory</div>

5.3.1 Coda Condition and Underspecification Theory

Within an OT framework, a family of constraints that reflects certain properties of codas has been discussed in terms of Coda Conditions (Itô 1989, McCarthy and Prince 1994, Itô and Mester and Padgett 1995, Itô and Mester 1999, Sohn 2002). Coda

<div align="center">107</div>

Conditions capture the fact that languages have favored and /or disfavored properties over codas. As a matter of fact, cross-linguistically, typical forms of codas have been discerned; the most well known forms of codas are unmarked segments such as coronal sonorants or plain stops. In Korean, similar patterns are attested regarding coda properties, and the properties have been addressed in terms of 'coda licensing' by Oh (1994). Her concept of 'coda licensing' suggests that the coda properties of Korean either should be specified by only a place node (labial, coronal, and dorsal), or should be specified by a segment carrying the feature [+sonorant] (/m n l ŋ/). By taking up the idea of coda licensing which confirms typical forms of codas in the cross-linguistic sense, coda conditions can be stated in terms of generalized constraints as in (29) and (30):

(29) Coda-Place

Coda may be specified only by major place node: No laryngeal and no terminal feature is allowed in codas.
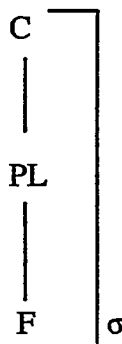
Figure 5.2 Coda-Place

(30) Coda- Sonorant

>Codas are specified by sonorant segments.

Both the constraints in (29) and (30) not only provide reasonable phonological

background for the properties of codas in Korean, but also capture cross-linguistically

generalized patterns. Based on the two constraints, then, coda-related phenomena such

as Coda Neutralization and Consonant Cluster Simplification in codas in Korean can be

accounted for. The examples in (31) show Coda Neutralization in Korean.

(31)   Coda Neutralization

>a. /nas/→[nat] 'scythe'   b. /nac/→[nat] 'day'

>c. /nac^h/→[nat] 'face'   d. /nat^h/→[nat] 'piece'

>e. /swup^h/→[swup] 'woods'   f. /pakk/→[pak] 'outside'

As the forms (31 a-d) indicate, coronal obstruents (s, c^h, t^h, c) in coda positions are

neutralized as the coronal plain stop /t/. Also, the aspirated or tensed consonants are

produced as their plain counterparts as in (31e-f). In fact, any features other than the

major place node are not allowed in coda position. In addition to the properties of

codas, the fact that the coronal obstruents *s, c^h, t^h, c* are neutralized into the consonant

'*t*' suggests that /t/ is the least marked segment in Korean. As Martin (1982) and

Whitman (1985) have pointed out, the neutralization process supports this claim since

neutralization typically is proceeded toward an unmarked segment, and based on the

idea they claimed that the least marked segment '*t*' is specified by an empty C slot. No place node is specified. In this case, all the features of the consonant '*t*' are reconstructed by redundancy rules.

Under the theoretical assumption presented here, several examples from the Coda Neutralization data in (31) are analyzed with reference to the constraints. The Tableau 5.1 illustrates the result of one such analysis.

Tableau 5.1 /nas/→[nat] 'scythe'

/nas/	Ident (F)-(voicing)	Coda-PL	Coda-Son	Ident (F)(+continuant)
☞ nat		*	*	*
Nas		**!	*	
Nan	*!	**		
nal	*!	**		

Regarding the input /nas/, four possible candidates are suggested: the possible candidates are assumed to be as faithful as possible to the input. In this case, the four candidates are faithful to the input in the sense that they share the coronal node with relation to their place of articulation specification. In Tableau 5.1, the winning candidate is [nat] in the first row. Since the major place node is not specified in coronals in Korean, the cases [nat] and [nas] violate the Coda-PL constraints. However, [nas] is

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worse than [nat] because it violates two properties with respect to the Coda-PL

constraint: in addition to the lack of major place node, the candidate [nas] is specified

by the additional terminal feature [+continuant]. Because of the two violations of the

Coda-PL constraint, [nas] is eliminated. In the cases of /nan/ and /nal/, they are ruled

out because of the Ident (F) constraint violation as it pertains to voicing. The Ident (F)

constraint family assesses featural identity of correspondent elements. Since the input

/nas/ has [-voice] feature in its coda, the candidates /nan/ and /nal/ which have [+voice]

feature are led to Ident (F) constraint violation. Before further analysis, some constraints

on corresponding elements which basically belong to the faithfulness constraint family

are defined as follows:

(32) MAX-IO: Every segment of the input has an identical correspondent in the

output. (No deletion of a segment)

(33) DEP-IO: Every segment of the output has an identical correspondent in the

input. (No insertion of a segment)

(34) The IDENT (F) constraints

IDENT (F)-IO: Output correspondents of an input [rF] segment are also [rF].

(McCarthy & Prince 1995: 264)

In (32)-(34), Max and Dep constraints concern segmental correspondence while Ident

(F) assesses featural correspondence. Therefore, when all these faithfulness constraints

are fully satisfied, the output will be exactly the same as the input. Any output which

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includes inserted segments causes Dep violation while any output in which there is a deleted segment causes Max violation. The featural disparity between corresponding segments, as in Tableau 5.1, results in an Ident (F) violation. One thing very crucial with relation to the Ident (F) constraint is that not all the features are treated equally.[9] In other words, depending on the language, certain featural disparity is treated more as a fatal violation than others. For example, in Tableau 5.1, the output [nat] violates the constraint Ident (+continuant), but it is still the winning candidate. The Ident (+continuant) violation is not fatal since the constraint is lower ranked than Coda-PL or Coda-Son.

At this point, one might ask what happens if the consonant in the coda position is simply deleted. In this case, the candidate [na] violates only the Max constraint. Since the candidate [na] does not have a coda, featural mappings are not possible. Therefore, it does not violate either Ident (F) or Coda-PL constraints. In order to choose the right output, the Max constraint must outrank coda condition constraints (Max >> Coda-PL, Coda-Son). As a result, the ordering of the suggested constraints is summarized in (35). More data in Tableau 5.2 and 5.3 support the constraint rankings:

(35) Max, Ident (F) >> Coda-PL, Coda-Son

---

[9] Considering the fact that laryngeal node and terminal features are not allowed in coda positions (by means of neutralization), the deletion of the laryngeal features (such as [+ spread glottis], [+constricted glottis]), and terminal features such as [+anterior], [+continuant] are assumed to constitute less fatal violations regarding feature correspondence. In Table 5.3, the Ident (F) (+spread glottis) constraint is also low-ranked.

Tableau 5.2 /nas/→[nat] 'scythe'

/nas/	Max	Ident (F)- (voicing)	Coda-PL	Coda-Son	Ident (F) (+cont)
☞ nat			*	*	*
nas			**!	*	
nan		*!	*		
nal		*!	**		
na	*!				

Tableau 5.3 /swupʰ/→[swup] 'forest'

/swupʰ/	Max	Ident (F)- (voicing)	Coda-PL	Coda-Son	Ident (F) (sp glottis)
☞ swup				*	*
swupʰ			*!	*	
swum		*!	*		
swu	*!		*		

5.3.2 *Complex constraint and CCS

While the coda conditions Coda-PL and Coda–Son explored through the coda neutralization analysis limit the property of a coda qualitatively, the *Complex constraint limits the property of a coda quantitatively. As the statement in (36) states, language has the *Complex constraint indicating that complex onsets and codas are not allowed (Archangeli 1997).

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(36) *Complex

Syllables have at most one consonant at an edge.

The *Complex constraint, along with the two coda condition constraints, plays a

crucial role in analyzing CCS in Korean. Before exploring CCS in connection with the

*Complex constraint, some of the examples of CCS are repeated in (37). The examples

in (37) can be divided into two groups: i) the cases that exhibit no variation and ii) the

cases that exhibit variation. As discussed in the previous chapter, when a morpheme

boundary or a consonant follows an underlying -CC- coda, the nouns show no variation

while the predicates do show variation. In contrast, when a vowel follows, only the

nouns show variation.

(37) Consonant cluster simplification

    Nouns

    1. CVCC/__#

        a.   /hulk/→[huk] 'soil'

        b.   /salm/→[sam] 'life'

        c.   /kaps/→[kap] 'price'

    2. CVCC__C

        d.   /hulk+to 'also'/→[huk-to] 'soil also'

        e.   /salm+to 'also'/→[sam-to] 'life also'

        f.   /kaps+to 'also'/→[kap-to] 'price also'

(36) *Complex

Syllables have at most one consonant at an edge.

 The *Complex constraint, along with the two coda condition constraints, plays a

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nouns show variation.

(37) Consonant cluster simplification

Nouns

1. CVCC/__#

    a.   /hulk/→[huk] 'soil'

    b.   /salm/→[sam] 'life'

    c.   /kaps/→[kap] 'price'

2. CVCC__C

    d.   /hulk+to 'also'/→[huk-to] 'soil also'

    e.   /salm+to 'also'/→[sam-to] 'life also'

    f.   /kaps+to 'also'/→[kap-to] 'price also'

5.3.3. Non-Variational Cases

Tableaux 5.4 and 5.5 illustrate how each phonetic form for /hulk/ and /salm/ is finalized within optimality theoretic analysis.

Tableau 5.4 /hulk/→[huk] 'soil'
*Complex >> Max >> Coda-PL >> Coda -Son

/hulk/	*Complex	Max	Coda-PL	Coda-Son
☞ huk		*		*
hul		*	**!	
hulk	*!		*	*

In Tableau 5.4, the winning candidate is [huk] in the first row. The candidate [hulk] is ruled out because of the *Complex constraint violation. The *Complex constraint prohibits clusters in coda positions. The candidate [hul], in the second row, is also ruled out because of the Coda-PL violation. To choose the right output, the constraint ranking must be ordered as in Tableau 5.4: *Complex>> Max >> Coda-PL >> Coda-Son. Since the candidate [hul] and [hulk] violate higher ranked constraints, Coda-PL and *Complex, the candidate [huk] which violates the lowest ranked constraint Coda-Son, is chosen as the optimal output. The Max constraint also should be higher-ranked than Coda-PL to eliminate the candidate such as [hu], which does not violate any of the other three constraints. Another example, /salm/→[sam], from the noun category is presented in Tableau 5.5.

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Tableau 5.5 /salm/→[sam] 'life'
*Complex >> Max >> Coda-PL >> Coda -Son

/salm/	*Complex	Max	Coda-PL	Coda-Son
☞ sam		*	*	
sal		*	**!	
salm	*!			

By the same constraint ranking as in the Tableau 5.4, [sam] is chosen as the winning

candidate. The candidate [salm] is eliminated by *Complex. Between [sal] and [sam],

the candidate [sal] is eliminated because it violates Coda-PL more badly. While the /m/

in [sam] has a place specification (labial), /l/ in the [sal] has no place specification.

Therefore, although both /m/ and /l/ have manner specifications which cause Coda-PL

violation, the candidate [sam] becomes the winning candidate. The cases followed by a

consonant also can be analyzed by applying the same constraint ranking as in the above.

Tableaux 5.6 and 5.7 present the case of /hulk+to/ and /salm+to/ respectively.

Tableau 5.6 /hulk+to/→[huk-to] 'soil also'
*Complex >> Max >> Coda-PL >> Coda -Son

/hulk+to/	*Complex	Max	Coda-PL	Coda-Son
☞ huk-to		*		*
hul-to		*	**!	
hulk-to	*!		*	
hul-kto	*!			

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Tableau 5.7 /salm+ to/→[sam-to] 'life also'
*Complex >> Max >> Coda-PL >> Coda -Son

/salm+to/	*Complex	Max	Coda-PL	Coda-Son
☞ sam-to		*	*	
sal-to		*	**!	
salm-to	*!		**	
sal-mto	*!			

Here, both Tableaux 5.6 and 5.7 present the same set of constraints and constraint rankings as the Tableaux 5.4.and 5.5. In fact, this constraint ranking results in the right form for each noun.

Bearing in mind the constraint ranking suggested in the noun analysis, now the predicates that show no variation are considered. Ultimately, the suggested constraint ranking could account for the cases of the predicates also. Under this assumption, the first example, /ilk+un/ 'read' is analyzed in Tableau 5.8.

Tableau 5.8 /ilk-un/→[il-kun] 'to read'
*Complex >> Max >> Coda-PL >> Coda -Son

/ilk+un/	*Complex	Max	Coda-PL	Coda-Son
☞ il-kun			**	
i-lun		*!		
i-kun		*!		
ilk-un	*!		*	

By means of the same constraint ranking suggested in the noun analysis, the candidate

[il-kun] is chosen as the optimal output. As a matter of fact, the winning output [il-kun]

faithfully corresponds to the input. By resyllabifying the second member of the cluster

as the onset of the next syllable, the candidate [il-kun] avoids both the *Complex and

the Max constraint violation. The candidates [i-lun] and [i-kun] are ruled out because

both of them violate the Max constraint. In spite of its segmental correspondence to the

input, the case of [ilk-un] leads to the *Complex violation, and because of this [ilk-un]

is eliminated. Another case, /palp-un/, from the predicates are given in Tableau 5.9.

Tableau 5.9 /palp+un/→[pal-pun] 'to tread'
*Complex >> Max >> Coda-PL >> Coda -Son

/palp+un/	*Complex	Max	Coda-PL	Coda-Son
☞ pal-pun			**	
pa-lun		*!		
pa-pun		*!		
palk-un	*!		*	

5.3.4 Variational Cases

Within the optimality theoretic framework, variation in languages has been

discussed by referring a constraint reranking mechanism (Kenstowicz 1993, Iverson &

Lee 1994, Ohala 1996, Anttila & Cho 1998). Thus far, the suggested set of constraints

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and constraint ranking has been effective in choosing right outputs. Based on this, the forms causing variation are investigated in terms of constraint rerankings.

Here the predicates are considered first. The variation in the predicates is occurred before a consonant, in this case, as the examples in (37) presents, three phonetic forms are attested throughout the experiment. The first case of the variation is from the predicate, *ilk-ta* 'read.' First of all, in Tableau 5.10, the previously suggested constraint ranking picks the [ik-ta] form as the final output for /ilk-ta/.

Tableau 5.10 /ilk-ta/→[ik-ta] 'read'
*Complex >> Max >> Coda-PL >> Coda -Son

/ilk-ta/	*Complex	Max	Coda-PL	Coda-Son
☞ ik-ta		*		*
il-ta		*	**!	
i-ta		**!		
ilk-ta	*!			

In this case, the prescriptively grammatical form [ik-ta] is chosen as the final phonetic form by employing the same constraint ranking as the non-variational case. As a matter of fact, in the prescriptive grammar, [ik-ta] is assumed to be a completely predictable output for /ilk-ta/. However, throughout the experiment, other variable forms, such as [il-ta] and [ilk-ta] are also detected. By manipulating the constraint ranking, the two variational forms, [il-ta] and [ilk-ta] can be explained. In Tableau 5.11, the ranking between Coda-Son and Coda-PL are reordered as Coda-Son >> Coda-PL. In this case,

[ik-ta] is ruled out by violating higher ranked Coda-Son constraint. As a result, the

candidate [il-ta] is chosen as the winning output instead of [ik-ta].

Tableau 5.11 /ilk-ta/→[il-ta] 'read'
Coda-Son >> Coda -PL

/ilk-ta/	*Complex	Max	Coda-Son	Coda-PL
☞ il-ta	.	*		**
ik-ta		*	*!	
i-ta		**!		
ilk-ta	*!		*	

Regarding the other non-prescriptive form, [ilk-ta], one of the faithfulness

constraints, Max, plays a crucial role in choosing the winning candidate. As described

earlier, the MAX constraint prohibits segmental deletion. While underlying cluster

codas are assumed to be simplified as a single coda, the results of the experiment

suggest that cluster codas also can be surfaced as a final phonetic form. In this case, the

Max constraint, which requires complete input and output segmental agreement,

outranks all the other constraints including the *Complex constraint. Tableau 5.12

illustrates this.

Tableau 5.12 /ilk-ta/→[ilk-ta]

Max >> *Complex, Coda-Son, Coda-PL

/ilk-ta/	Max	*Complex	Coda-Son	Coda-PL
☞ ilk-ta		*	*	**
ik-ta	*!		*	
il-ta	*!			**

In Tableau 5.12, when the Max constraint is the highest ranked constraint, the other two forms, [ik-ta] and [il-ta], are eliminated since there are deleted segments in these two forms. In this case, "faithfulness" to the input is highly favored. In the same way, the variation in /palp-ta/→[pap-ta]~[palp-ta] can be explained. Each Tableau 5.13-5.15 represent how to each final phonetic form is selected.

Tableau 5.13 /palp-ta/→[pap-ta] 'tread'

*Complex >> Max >> **Coda-PL >> Coda -Son**

/palp-ta/	*Complex	Max	Coda-PL	Coda-Son
☞ pap-ta		*		*
pal-ta		*	**!	
palk-ta	*!		**	*

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Tableau 5.14 /palp-ta/→[pal-ta] 'tread'
*Complex >> Max>> **Coda-Son >> Coda-PL**

/palp-ta/	*Complex	Max	Coda-Son	Coda-PL
☞ pal-ta		*		**
pap-ta		*	*!	*
palp-ta	*!		*	**

Tableau 5.15 /palp-ta/→[palp-ta]
Max >> *Complex, Coda-Son, Coda-PL

/palp-ta/	Max	*Complex	Coda-Son	Coda-PL
☞ palp-ta		*	*	**
pap-ta	*!		*	
pal-ta	*!			**

Based on the analysis discussed so far, the variation in the predicates can be explained in terms of constraint rerankings. The three different constraint rankings suggested with relation to the variation are summarized in (38).

(38) Constraint rankings depending on the variation

Dialect A (prescriptively correct): *Complex >> Max >> Coda-PL >> Coda-Son

Dialect B (variation): *Complex >> Max>> Coda-Son >> Coda-PL

Dialect C (variation): Max >> *Complex, Coda-Son, Coda-PL

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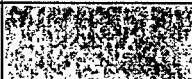
It is clear that different rankings predict different final output forms. However, not every possible set of ranking is permissible. There is a limitation such as Coda-PL and Coda-Son cannot outrank the Max constraints in Korean: the Max constraint is always higher ranked than the coda-related constraints. In general, variation arises due to different preferences between two competing constraints. Here in CCS analysis, the variation (Dialect B) in the predicates is caused by different preference for the two coda constraints, Coda-PL and Coda-Son. When a speaker prefers the Coda-PL constraint to the Coda-Son constraint, his/her output results in the form satisfying the Coda-PL constraint (e.g. /ilk-ta/ 'read' → [ik-ta]), and preference for the Coda-Son constraint results in the other output form (e.g. /ilk-ta/ 'read' → [il-ta]). The other variation pattern (Dialect C) is not related to coda condition. In this case, the variation results from the different preference between the two constraints, *Complex and Max. The point is that a reranking mechanism in constraint-based approaches provides an effective explanation regarding conflicting variability in languages.

While the prescriptively grammatical forms discussed so far are classified as Dialect A, regarding the constraint ranking, the predicates from /lt^h / cluster are analyzed in a different way. In the case of /hwult^h-ta/ 'to hackle' and /halt^h-ta/ 'to lick,' the prescriptively correct forms are [hwul-ta] and [hal-ta] respectively. In both of the cases, Coda-Son is higher ranked than Coda-PL (Coda-Son >> Coda -PL), and this is different from the other prescriptively grammatical forms which have Coda-PL >> Coda-Son constraint ranking. In other words, if Dialect A constraint ranking is

considered for the /hwult^h-ta/, [hwut-ta] is incorrectly chosen as the optimal output.

Consider Tableau 5.16.

Tableau 5.16 /hwult^h-ta/→* [hwut-ta] 'to hackle'
Complex>> Max >> Coda-Son >> Coda-PL

/hwult^h-ta/	*Complex	Max	Coda-PL	Coda-Son
?☞ hwut-ta		*	*	*
hwul-ta		*	**!	
hwult-ta	*!			
hwult^h-ta	*!			

(? : indicates wrong output)

In Tableau 5.16, both [hwut-ta] and [hwul-ta] violate the Coda-PL constraint since the

codas, /t/ and /l/, from each candidate are lacking place specification. As already

mentioned, coronals have no place specification in Korean. However, as far as Coda-PL

concern, /l/ is worse than /t/. In addition to the lack of place specification, /l/ has

additional manner specification [+lateral]. Therefore, the candidate [hwul-ta] doubly

violates the Coda-PL constraint, and as a result, it is ruled out. From Tableau 5.16, even

though two candidates violate the same constraint, depending on the degree of violation,

the optimal output can be chosen.

Another phonetic form, [hwult-ta] also supports the idea of the degree of

violation: the more a constraint is violated, the worse. In Tableau 5.17, the highest

ranked constraint, Max eliminates the two candidates, [hwul-ta] and [hwut-ta].

Regarding the other two candidates, [hwult-ta] and [hwult^h-ta], the Coda-PL constraint

plays a decisive role. Although both of the candidates violates Coda-PL, the form

[hwult^h-ta] is eliminated since this form violates the constraint more badly than [hwult-

ta]. Between /t/ and /t ^{h}/, the segment /t ^{h}/, which has a laryngeal feature, is worse than

/t/. Therefore, the output [hwult^h-ta] is eliminated. Again, not only the constraint

rankings but also the degree of violation affects in deciding which candidate is the

winning output.

Tableau 5.17 /hwult^h-ta/→[hwult-ta]
Max >> *Complex >> Coda-PL >> Coda-Son

/hwult^h-ta/	Max	*Complex	Coda-PL	Coda-Son
?☞ hwult-ta		*	***	*
hwult^h-ta		*	****!	*
hwul-ta	*		**!	
hwut-ta	*!		*	*

To choose the prescriptively grammatical form, [hwul-ta] for /hwult^h-ta/, the constraint

ranking between Coda-PL and Coda-Son has to be switched. In other words, the

constraint ranking suggested in Dialect B predicts the prescriptively correct form,

[hwul-ta] as the optimal output (Tableau 5.18).

<p style="text-align:center">Tableau 5.18 /hwult^h-ta/→[hwul-ta] 'to hackle'
*Complex >> Max >> Coda-Son >> Coda-PL</p>

/hwult^h-ta/	*Complex	Max	Coda-Son	Coda-PL
☞ hwul-ta		*		**
hwut-ta		*	*!	*
hwult-ta	*!	*	*	***
hwult^h-ta	*!		*	****

From the analysis of the /lt^h/cluster, an important point can be elicited. With relation to constraint rankings, the cases of /hwult^h-ta/ and /halt^h-ta/ suggest that in Dialect A, Coda-Son >> Coda-PL ranking relationship exists as potential ranking although the majority of the data are analyzed as Coda-PL >> Coda-Son ranking. In other words, the variation presented in here is considered to be a reflection of such a potentiality.

<p style="text-align:center">5.4 Relexicalization in the Monosyllabic nouns</p>

While the variation in the predicates can be explained in terms of constraint rerankings, the non-prescriptive cases of the nouns cast somewhat different issues with relation to CCS in Korean. As discussed earlier, the nouns show variation only before a vowel, and in this case the phonetic forms of the nouns contrast in two ways: i) both segments are parsed (no deletion occurs), ii) only one segment parsed (deletion occurs). The constraint ranking suggested for the prescriptively grammatical form predicts that

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before a vowel, the syllabification of both segments is the optimal form for the nouns.

Tableau 5.19 represents the case of /hulk+i/→[hul-ki].

Tableau 5.19 /hulk+i / →[hul-ki] 'soil'
*Complex >> Max >> Coda-PL >> Coda –Son

/hulk+i/	*Complex	Max	Coda-PL	Coda-Son
☞ hul-ki			*	
hu-ki		*		
hu-li		*		
hulk-i	*!		**	*

In this case, the candidate [hul-ki] in the first row is chosen as the optimal output, and

this form is the right form for Dialect A. As shown in the predicate analysis, before a

vowel, the candidates that syllabify both of the segments in the codas are selected as the

winning candidates for the prescriptively correct forms because of the highly ranked

Max constraint. The suggested constraint ranking in Tableau 5.19 picks the right

candidate for the prescriptively grammatical form. Then, as for the other phonetic form

[hu-ki], constraint ranking B and C are considered. Tableau 5.20 and 5.21 present

constraint ranking B and constraint ranking C, respectively.

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Tableau 5.20 Constraint ranking B:
*Complex >> Max >> Coda-Son >> Coda –PL
/hulk+i/→ ? [hul-ki] 'soil'

/hulk+i/	*Complex	Max	Coda-Son	Coda-PL
?☞ hul-ki				**
hu-ki		*!		
hu-li		*!		
hulk-i	*!			

Tableau 5.21 Constraint ranking C:
Max >> *Complex, Coda-PL, Coda-Son
/hulk+i/→ ? [hul-ki] 'soil'

/hulk+i/	Max	*Complex	Coda-PL	Coda-Son
?☞ hul-ki			**	
hulk-i		*!	**	*
hu-ki	*!	*		
hu-li	*!	*		

As Tableaux 5.20 and 5.21 show, in both of the rankings (B and C), the prescriptively grammatical form [hul-ki] is still chosen as the optimal output. In other words, there is no way to pick [hu-ki] as the winning output with either Dialect B ranking or Dialect C ranking. This might indicate that another constraint ranking is needed. For example, when Coda-PL is ranked higher than Max, there is a possibility that [hu-ki] can be a winning candidate. The problem is that, however, this ranking results in not only [hu-ki]

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but also [hu-li] as a winning output at the same time. Moreover, as discussed in § 5.3,

ranking the Coda-PL constraint higher than the Max constraint produces more

problematic outputs with relation to coronal codas. Therefore, the ranking order

between Max and Coda-PL cannot be switched. Once the variation in the nouns is

discovered not to be a matter of constraint reranking, it leads to another direction of

analysis, such as relexicalization in the nouns.

According to Sohn (2002), some cluster coda nouns undergo relexicalization

triggering the nouns to be simple coda nouns, and because of that, the variation in the

nouns occurs. Also, she claims that this relexicalization of input forms is considered

evidence of linguistic change based on the idea of input–output correspondence. The

point is that within optimality theory, rather than postulating an output form derived

from an input form, optimizing the lexicon of an input form (same as the output form) is

assumed to be reasonable (Smolensky 1996). In Korean, one can argue that a noun such

as /tols/ 'the first birthday' is already relexicalized as /tol/, a single coda word. In this

word, /s/ never surfaces as a phonetic form either before a vowel, or a consonant.

Although the degree of variation differs depending on each noun, in general, the

variation occurring in the nouns is considered as an example of relexicalization based

on the idea of lexical optimization. Some of the subjects' categorical behaviors support

this: as for the speakers who produce prescriptively ungrammatical forms (one member

of clusters is deleted: e.g. /kaps + i / → [ka-pi] 'price,' /neks + i / → [ne-ki] 'soul'), no

case that both segments pronunciation (e.g. /kaps + i / → [kap-si], /neks + i/ → [nek-si]

) is observed. They are considered to have single coda forms with relation to the cluster

nouns. As for this, there is no reason to put coda clusters in the underlying forms when the forms are never observed as output forms. Therefore, the variational forms occurred in the nouns are analyzed as single coda words. Based on this, the relexicalization of the nouns can be summarized in (37).

(37) Relexicalization

a. /kaps/→/kap/ 'price'

b. /neks/→/nek/ 'soul'

c. /hulk/→/huk/ 'soil'

d. /talk/→/tak/ 'chicken'

e. /saks/→/sak/ 'wage'

f. /yeotelp/→/yeotel/ 'eight'

g. /salm/→/sam/ 'life'

When each relexicalized form is considered an input form, the variation in the nouns is explained without any constraint reranking. In Tableau 5.22, the prescriptively ungrammatical form, [hu-ki] from /hulk+i/, is reanalyzed. Here we must introduce a new constraint:

(38) Onset: Syllables begin with a consonant.

This constraint, commonly cited in the literature (Itô and Mester and Padgett 1995, Ohala 1996, Archangeli 1997 etc.) serves to choose the right output in Tableux 5.22-5.25.

Tableau 5.22 /hulk+i / <u>relexicalization</u> /huk+i/→[hu-ki] 'soil'
(Comlex >> Max >> Onset >> Coda-PL, Coda-Son)

/huk+i/	*Complex	Max	Onset	Coda-PL	Coda-Son
☞ hu-ki					
huk-i			*!		
hu-i		*!			

In Tableau 5.22, although the orthography of /hulk+i/ reflects coda cluster, as for the input form, single coda is posited by means of relexicalization. Between the two candidates, [hu-ki] and [huk-i], the candidate [hu-ki] in the first row is chosen as the winning candidate. The candidate [huk-i] is eliminated by violating the Onset constraint. In this case, since coda cluster is not related, rather than the *Complex constraint, the Onset constraint requiring to maximize onsets plays a crucial role in deciding the winning candidate. The two different phonetic forms, [kap-si] and [ka-pi] for /kaps+i/ are presented in Tableau 5.23 and 5.24.

Tableau 5.23 /kaps+i/→[kap-si] 'price'
(*Complex >> Max >> Onset >> Coda-PL, Coda-Son)

/kaps+i/	*Complex	Max	Onset	Coda-PL	Coda-Son
☞ kap-si					*
ka-pi		*!			
kaps-i	*!		*	**	*

Tableau 5.24 /kaps+i/ ^{relexicalization} /kap+ i/ →[ka-pi] 'price'
(*Complex >> Max >> Onset >> Coda-PL, Coda-Son)

/kap+i/	*Complex	Max	Onset	Coda-PL	Coda-Son
☞ ka-pi					
kap-i			*!		*
ka-i		*!			

In the case of both segments of syllabification, as in Tableau 5.23, the input form is

assumed to be /kaps+ i/. Under the dialect A constraint ranking, the right output [kap-si]

is chosen as the optimal candidate. Tableau 5.24 presents the case of relexicalization in

the noun /kaps/ 'price.' When the relexicalized form /kap+i/ is posited as the input form,

the form [ka-pi] is chosen as the optimal output.

As for the coda cluster nouns, the variation is considered as an instance of

relexicalization: from cluster codas to single coda. The relexicalization process

suggested here explains the variation in terms of sound change related with lexical

diffusion (Kiparsky 1995). Lexically diffused sound change, according to Kiparsky,

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shows an item-by item sound change in the relevant lexicon. In fact, with respect to the variation in the nouns, one thing noticeable is that there is a difference in the degree of reinforcement of relexicalization: different frequencies of the variational forms reflect this point. Concerning the different degree of relexicalization, Choi (2004) suggests that there is a connection between word frequency and the degree of relexicalization. In particular, the nouns having /-Cs/ clusters (e.g. *saks* 'wage,' *kaps* 'price,' *neks* 'soul' and so on) show a pattern depending on their frequency. In the process of resyllabification, the most frequent word /kaps/ tends to be syllabified by both segments of coda clusters, while the least frequent word /saks/ tends to be syllabified by one member (by 'k') of coda clusters. In this case, low frequency is considered to cause loss of memory since in /-Cs/ clusters, /s/ is never realized phonetically. In addition to word frequency, Choi's study claims that the relexicalization is also depending on the cluster types. In the cases of /hulk/ 'soil' and /talk/ 'chicken,' differently from the cases of /-Cs/ coda cluster nouns, relexicalization is due to their high frequency. Also, in the case of the noun /salm/ 'life,' the morphological information that the consonant 'm' has as a nominal marker is suggested to cause a different pattern of variation from the other cluster words regarding relexicalization.

5.5 Summary

In this chapter, the attested variation in CCS was analyzed by employing Optimality Theory. In the case of predicates, three alternative phonetic forms were successfully accounted based on constraint reranking mechanism: depending on specific constraint ranking, each phonetic form was correctly predicted. Variation in the nouns,

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however, relexicalization based on the concept of lexical optimization was proposed to be related to.

As a formal model of linguistic theory, rather than positing different grammar, Optimality Theory provides a consistent module for language variation analysis. In particular, the crucial concepts such as 'reranking constraints' and 'lexical optimization' suggested in OT successfully account the variation by referring speakers' different preferences for each linguistic pattern.

CHAPTER 6

CONCLUSION

6.1 Introduction

As stated in Chapter 1, the purpose of this dissertation was to provide a more

satisfactory explanation for the variable phonetic realization of morpheme-final clusters

in Korean by considering both theoretical and empirical perspectives. With respect to

the empirical aspect of this study, the patterns of variation observed in CCS were

investigated with relation to two linguistic factors--lexical category and the following

segment types--and four non-linguistic factors--age, gender, educational level, and

register. From a theoretical perspective, this study examined the phonological properties

of the surviving (or deleted) segments in Consonant Cluster Simplification (CCS), and

then attempted to understand those properties in terms of Optimality Theory, which

approaches phonological explanation in terms of linguistic constraints.

In this chapter, the issues addressed thus far are reviewed and contextualized.

First, the general findings and patterns of the field-based experiment are summarized. In

this process, the observed variable forms found in this study are compared with those of

previous studies and presented in the form of a table. Second, the theoretical

implications of the variation found in the CCS data are placed within Optimality Theory

and summarized. Lastly, the larger implications of this study are considered and

suggestions for future research are presented.

6.2 Summary of General findings

One of the noticeable findings in this study was that except for a couple of words, in most of the coda cluster words, both prescriptive and non-prescriptive forms were produced. Furthermore, in many of the target words, non-prescriptive variant forms were more frequently produced than prescriptively correct forms. As was shown in Chapter 4 (Tables 4.1 & 4.2), among the fourteen predicates, nine of them showed around 50% of frequency in their variational form production: *yalp-ta* 'be thin,' *ilk-ta* 'read,' *malk-ta* 'be clear,' *palk-ta* 'be bright,' *nalk-ta* 'be shabby,' *ttelp-ta* 'be astringent,' *mwulk-ta* 'be weak,' *ulp^h-ta* 'recite,' *palp-ta* 'tread.' In the case of nouns, as Table 4.4 presents, four nouns out of the eight showed more than 50% of frequency in their variational form productions: *saks* 'wage,' *hulk* 'soil,' *talk* 'chicken,' *yeotelp* 'eight.'

Perhaps most importantly, the results of this research indicate a marked difference from those reported in previous work: there is far more variation in the production of underlying /-CC/ stems that acknowledged. Given that previous work was typically based on a faulty assumption –that the speech community is homogeneous in its behaviors- it is not surprising that this apparent degree of variability went unnoticed. In addition, considering the range of variants found in this research-especially the productions of [CCC] form in the predicates-the significance of the empirical data presented here must be emphasized: When theoretically impossible phonetic forms actually arise as surface forms (e.g. [palp-ta] 'tread,' and [ilk-ta] 'read'), one must

seriously question the relationship between fact and theory. Such questioning is a vital part of all research.

As far as the variation is concerned, the combination of lexical category and following segment type played important roles: the variation of the predicates occurred only before a consonant while the variation of the nouns occurred only before a vowel. Concerning the phonetic forms, the predicates typically showed a full set of three way contrasts before a consonant:

i) the realization of only C_1 (e.g. /palp-ta/ 'tread' →[pal-ta]);

ii) the realization of only C_2 (e.g. /palp-ta/→ [pap-ta]); or

iii) the realization of both Cs (e.g. /papl-ta/ →[palp-ta]).

In the case of nouns followed by a vowel, we found a two way contrast:

i) either one member of the cluster was syllabified

(e.g. /hulk +i / 'soil'→ [hu-ki] / kaps+ i / 'price'→ [ka-pi]); or

ii) both members of the cluster were syllabified

(e.g. /hulk +i/ →[hul-ki], /kaps+ i/ →[kap-si]).

What is important to realize is that the variation summarized above contradicts all prescriptive accounts of CCS, which dictates that (a) three-consonant clusters (C-C-C) are unequivocally ungrammatical in Korean and (b) all C-C clusters must be syllabified per their orthographic representations. Moreover, the three way contrasts attested in the predicates cast a new light with relation to the theoretical development of CCS analysis: some of the forms attested in this study (e.g. the realization of C-C-C clusters and the relation of underlying /-lp/~/-lk/ clusters with only [l]) have not been previously

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discussed and thus need to be explored in terms of phonological properties in Korean. Table 6.1 summarizes each cluster's phonetic form as presented in previous studies.

Table 6.1 Variation of consonant clusters for underlying /-lC/

Underlying Representation	Surface Representation					
	C.W. Kim (1967)	Kim-Renaud (1974)	S.C. Ahn (1985)	Whitman (1985), Hong (1989), Oh (1994)	Park (1990)	Choi (2005)
ilk-ta 'read'	ik-ta	ik-ta il-ta ilk-ta	ik-ta	ik-ta il-ta	ik-ta il-ta ilku-ta	ik-ta il-ta ilk-ta
palp-ta 'tread'	Pap-ta	pap-ta pal-ta palp-ta	pap-ta	pap-ta pal-ta	pap-ta pal-ta palpu-ta	pap-ta pal-ta palp-ta
ulp^h-ta 'recite'	up-ta	up-ta ul-ta ulp-ta	up-ta	up-ta ul-ta		up-ta ul-ta ulp-ta
hwult^h-ta 'hackle'	hwul-ta	hwul-ta	hwul-ta	hwul-ta	hwul-ta hwut-ta hwult-ta	hwul-ta hwut-ta hwult-ta

As for the factors associated with the variation in CCS, except for subjects' level of education, all the other factors suggested in this research were discovered to be

statistically significant: the following segment type (vowel vs. consonant, and 'k' vs. 't'), the subjects' age, the subjects' gender, and speech register.

Firstly, with relation to the following segment type, variation in the noun was caused only before vowels, while variation in the predicates were caused only before consonants. In particular, the variation in the predicates occurred more frequently before the segment /t/ than before /k/.

Secondly, in both the nouns and the predicates, variation was found to be related to the subjects' age. In the case of nouns (before a vowel), the pattern of the variation was distinguished by two groups: over thirty (subjects born before 1976) vs. under thirty (subjects born after 1976). The over thirty group consistently showed a higher frequency regarding the syllabification of both segments (which is prescriptively grammatical) than the under thirty group. In the predicates, the connection between the variation and the subjects' ages was detected only in the /-lk/ cluster, and the pattern of the variation was also distinguished by two age groups. However, in this case, the range of the variation was broader than the case of the nouns: subjects ranging in age from 18 to their 40s were grouped as one. In other words, the subjects were divided by over fifty versus under fifty groups. In /-lk/ cluster, [-l-CV] (which is prescriptively ungrammatical) forms were produced more frequently by subjects under fifty than by those over fifty. The relationships between the variation and the ages discovered in this research suggests that language change is going on the cluster words: i) for the nouns, morphological change (lexically diffused sound change), from complex coda to single coda, ii) for the predicates, sound change from [-kC] to [-lC].

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(39) Morphological change

/talk/ 'chicken' → /tak/ ([tak], /tak+i/→[ta-ki], /tak+ul/ →[ta-kul])

/saks/ 'wage' → /sak/ ([sak], /sak+i/ →[sa-ki], /sak+ul/ →[sa-kul])

(40) Sound change

/ilk-ta/ 'read' →[il-ta]

/palk-ta/ 'be bright' →[pal-ta]

/malk-ta/ 'be clear' →[mal-ta]

Thirdly, as for the gender variable, the variation in the nouns (before a vowel) was discovered to be related to the female subjects' higher frequency of prescriptively grammatical forms (i.e., syllabification of both segments) than the male subjects. In the case of the predicates, no relationship between the gender of the subjects and variation was detected.

Lastly, variation based on register was attested with relation to CCS. In most cases, the casual speech resulted in a relatively higher frequency of prescriptively ungrammatical forms than the other styles. One thing that was very noticeable was that in the word list reading, the subjects tended to pronounce both segments of the clusters regardless of the lexical category of the target words. In other words, orthography is considered to play an crucial role in producing the target words when the subjects are highly conscious regarding their tasks. Therefore, the unexpected high frequency of ungrammatical form productions in the predicates in careful speech situation (word list

reading) is attributed to the influence of orthography, since in the predicates the

production of both segments is prescriptively ungrammatical.

6.3. Summary of OT and Language Variation, Change

Throughout the linguistic experiment, this research showed that there is

variation in CCS even at the intra-dialectal level. As stated earlier, the aim of this

dissertation is to provide more satisfactory explanation regarding the variation occurring

in CCS by employing the formal model of Optimality Theory.

According to Optimality Theory, language variation can be explained in terms

of constraint rerankings. Basically, the constraint rerankings reflect different

preferences for competing constraints within a language (Kiparsky 1993). In the case of

Korean CCS, the variation in the predicates is due to the competing constraints headed

by the following two constraint families: faithfulness constraints (*Complex versus

Max) and Coda Condition constraints (Coda-Pl versus Coda-Son). The attested patterns

of variation in the predicates, i.e., the alternation of three phonetic forms, are

successfully accounted for using the constraint reranking mechanism:

i)   When the Max is highly ranked, output forms are fully faithful to the

          input forms. No deletion occurs; as a result, both segments are

          pronounced.

ii)   When *Complex is highly ranked, one member of the clusters is

          deleted. In this case, the deleted segments ultimately refer to the

          rankings between Coda-PL and Coda-Son.

As a result, this research suggests the variation in the predicates can be explained in terms of three different constraint rankings.

Dialect A (prescriptively grammatical- standard form):

*Complex >> Max >> Coda-PL >> Coda-Son

Dialect B (variation pattern 1 – age and gender related variation):

*Complex >> Max>> Coda-Son >> Coda-PL

Dialect C (variation pattern 2 – stylistic variation):

Max >> *Complex >> Coda-Son, Coda-PL

Assuming that constraint reranking mechanism provides a theoretical explanation regarding variation, the patterns elicited from the quantitative analysis were examined with the aim of discovering a relationship between the constraint reranking mechanism and two types of factors: linguistic factors- i.e., lexical category and following segment type and non-linguistic factors-i.e., age, gender, and register. As the concept 'constraint reranking' represents, the relationships between the patterns and the factors are considered a reflection of different preferences for subdivided grammars. In particular, with relation to the social factors, the results suggest variability in the patterns rather than categorical predictability. Optimality Theory based on constant optimization (choice) provides a successful explanation regarding those kinds of patterns or tendencies. As Hinskens, Hout &Wetzels (1997) have pointed out, one of the valuable aspects of optimality-theoretic approaches is that within the OT framework, variation is a matter of choice for subdivided grammars rather than different grammars.

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Therefore, both categorical variation as well as individual levels of stylistic variation can be accounted for as a result of different strategies regarding the subdivided grammars. In the case of Korean CCS, social factors are considered to interact with competing constraints.

In accounting for the role of social factors in the variation, the data provide evidence that certain social factors are more crucially related with certain constraint ranking than others. For example, in the /lk/ cluster predicate, the three different alternations ([-l-CV], [-k-CV], and [-lk-CV]) are discovered to occur with different frequency depending on the subjects' age: in the oldest group, the relative frequency of [-k-CV] form is higher than that of the younger group, but the relative frequency of [-l-CV] form is higher in the younger group than that of the oldest group. As the term 'relative frequency' indicates, the observed difference regarding the preferred forms is elicited quantitatively, and based on the quantitative analysis, the patterns of variation are inferred as the interaction between subject's age and constraint rankings: younger people tend to produce [-l-CV] forms in /lk/ clusters. In this case, the constraint Coda-Son is higher ranked than the Coda-Place. The other social factors, gender and register which turn out to be related with the patterns of the variation also can be discussed under the same inference.

While the variation in the predicates is explained in terms of constraint re-rankings, the variation in the nouns is analyzed as an instance of relexicalization: lexical information of the nouns is changing from "cluster-coda" words to "single-coda" words. More specifically, the relexicalization in the nouns is suggested to be the result of

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apparent lexically diffused sound change that is related to the words' frequency. For example, in /-Cs/ cluster nouns, relatively low frequent words such as *tols* 'the first birthday,' *saks* 'wage,' are argued to be more like relexicalized as single coda words than the other more frequent nouns, such as *neks* 'soul' and *kaps* 'price.' The loss of morphological information /s/ (since /s/ is never phonetically realized in coda position), as Phillips (1998) pointed out, affects least frequent words first due to the failure of memory, and different frequencies of /s/ realization in the /-Cs/ cluster nouns support that the relexicalization is occurring with different degree, in a word by word fashion.

Within the optimality theoretic approach, the suggested relexicalization is further supported by employing the concept of lexical optimization (Smolensky 1996). Regarding the two phonetic forms [sa-ki] and [sak-si] for *saks* 'wage,' instead of deriving two different output forms from the same input form /saks+i/, postulating two different input forms /sak+i/ and /saks+i/ for each output form [sa-ki] and [sak-si] respectively provides simpler and more reasonable theoretical analysis of CCS in Korean.

This dissertation started with a set of rather straightforward questions about the relationship between Korean underlying/orthographic forms and their corresponding phonetic realizations: why is *talk* 'chicken' pronounced as [tak] rather than [tal] in isolation? And why do some people say [tal-kun] while others say [ta-kun] when *talk* is followed by the suffix –*un*?

A study of a linguistic phenomenon cannot be simply a matter of embracing only linguistic theory or social factors, particularly when the phenomenon under

consideration is not categorical in nature. It requires a more thorough examination of the complicated interactions between these two aspects. This dissertation is an effort at combining these two aspects to provide more a successful explanation regarding the cluster simplification phenomenon in Korean.

6.4 Further Implications

Although the research presented in this dissertation might be considered innovative (and perhaps, even ambitious) in the sense that both theoretical and empirical aspects of language are explicitly considered, there are certainly additional issues regarding CCS that require further discussion in future studies. One such issue is the extent to which language variation is related to lexical categories and corresponding morphology. With respect to lexical category and variation, this research examined only two categories, noun and predicate. However, informal observation of compound noun usage (including this researcher's intuition as a native speaker of Korean) suggests that the role of word boundary is more complicated in compound nouns than in either simple nouns or predicates. For example, the phonetic realization of the cluster coda in the compound noun *talkal* (talk 'chicken' + al 'egg') 'chicken egg' is assumed to be different from the case that the noun is followed by an affix, *talkun* (talk 'chicken' + -un 'topic marker') 'chicken'. The phonetic realizations of /talk+al/ can be predicted as either [tak-al] or [ta-kal] while [ta-kun] or [tal-kun] are predicted for /talk+un/. Considering these two examples, the case of compound nouns suggests that cluster simplification occurs first and resyllabification is optional. However, in the case of nouns followed by vowel initial affix, cluster simplification is optional while

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resyllabification is obligatory. In spite of the similar phonological environment, these two examples show different patterns with relation their phonetic realization. Considering their different lexical background, a possible role of lexical information can be suggested for the different pattern of phonetic realization. Particularly, throughout pronunciation test (by means of comparison between compound nouns and nouns with affix), the connection between lexical information and variation can be elicited.

Another CCS-related topic that merits further research is variation analysis based on regional dialects. Although there are at least six major dialect regions recognized in Korea (Hong 1991), no study of CCS has been done to investigate dialectal differences, except for the Gyeongsang dialect. One of the striking findings in the existing (but limited) dialect research on CCS is that for /-lk/ clusters, non-standard [l] forms (known to be common in the Gyeongsang dialect) were discovered to be dominant forms in the standard dialect. It is not clear that wider use of this non-standard variant is caused by dialectal influence or not; all the same, the fact that non-standard [l] forms are possibly becoming dominant is a potentially important finding since the standard dialect has long been assumed to function as the language's only prestige form. Therefore, future evaluations of regional dialects will provide a more comprehensive understanding of CCS, not only from a purely sociolinguistic perspective but also in a theoretical sense.

With relation to relexicalization in the nouns, this research discussed the role of frequency or coda cluster types of individual nominal forms. For further elaboration of

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the role of frequency in relexicalization, various corpus analyses using a range of databases are suggested. The corpus analyses will provide not only frequency of occurrence but also information regarding frequently recurrent forms, which is also critical factor in relexicalization.

The general concept or schema of Optimality Theory taken in this dissertation has been inspirational as a formal model of language change and variation studies since its explanatory potential is highly expected to provide more satisfactory analysis regarding patterns of variation.

As a pioneering research effort employing Optimality Theory in the analysis of variation in Korean, this study is expected to contribute to the theoretical development of linguistics from a cross-linguistic perspective. Particularly, in the context of Korean linguistics, in which very little variation research has been conducted, this dissertation may open up the door toward further linguistic inquiring into topics long neglected in Korean language study.

APPENDIX A

WORD LIST OF MORPHEME-FINAL CLUSTERS IN KOREAN

(N: nouns, P: predicates)

ps/ N: /kaps/ 'price'

P: /eps-ta/ 'there is none, /kayeops-ta/ 'pitiful'

/ks/ N: /neks/ 'soul,' /moks/ 'share,' /saks/ 'wage'

P: none

/ls/ N: /tols/ 'the first birthday,' /kols/ 'valley'

P: none

/nc/ N: /none

P: /anc-ta/ 'sit,' /enc-ta/ 'place something on'

/lt^h/ N: none

P: /halt^h-ta/ 'lick,' /hwult^h-ta/ 'hackle'

/nh/ N: none

P: /kkunh-ta/ 'cut,' /manh-ta/ 'a lot,' /anh-ta/ 'is not,'

/lh/ N: none

P: /kolh-ta/ 'starve,' /kkwulh-ta/ 'kneel,' /kkulh-ta/ 'boil,' /talh-ta/ 'wear out,'

/ttwulh-ta/ 'make a hole,' /silh-ta/ 'dislike,' /ilh-ta/ 'lose,' /alh-ta/ 'sick'

/lp/ N: /yeotelp/ 'eight'

P: /palp-ta/ 'tread,' /nelp-ta/ 'wide,' /yalp-ta/ 'thin,' /ccalp-ta/ 'short,' /ttelp-ta/

'astringent'

/lp^h/ N: none

P: /ulp^h-ta/ 'recite'

/lk/ N: /chilk/ 'arrowroot,' /hulk/ 'soil,' /talk/ 'chicken'

P: /ilk-ta/ 'read,' /kwulk-ta/ 'thick,' /nulk-ta/ 'old' /malk-ta/ 'clear,' /mwulk-ta/ 'thin,' /palk-ta/ 'bright,' /pwulk-ta/ 'reddish'

/lm/   N: /salm/ 'life,' /alm/ 'knowing'

P: /kolm-ta/ 'fester,' /kwulm-ta/ 'starve,' /talm-ta/ 'resemble,' /salm-ta/ 'boil' /celm-ta/ 'young'

APPENDIX B

THE FULL TEXT FOR ECHO GAME

Sentence Type A (Targeted for monosyllabic nouns followed by a vowel)

1. *A :* (The researcher's sentence)
ku kos-ey- nun		*oli-to*	*talk-to*	*eps-eyo*
that place-at-TC		duck-also	chicken-also	not exist-POL.

   'There is neither duck nor chicken'

   B: (the subjects' respond sentence)
ku kos-ey	*talk-un*	*iss-eyo"*
that place-at	chicken-TC	exist-POL.

   'There is a star'

2. A: (The researcher's sentence)
ku kos-ey- nun	*saca-to*	*thokki-to*	*eps-eyo*
that place-at-TC	lion-also	rabbit-also	not exist-POL.

   'There is neither lion nor rabbit'

   B: (the subjects' respond sentence)
ku kos-ey	*thokki-un*	*iss-eyo"*
that place-at	rabbit-TC	exist-POL.

   'There is a rabbit'

3. A: (the researcher's sentence)
ku kos-ey- nun	*mole-to*	*hulk-to*	*eps-eyo*
that place-at-TC	sand-also	soil-also	not exist-POL.

   'There is neither sand nor soil'

   B: (the subjects' respond sentence)
ku kos-ey	*hulki-un*	*iss-eyo"*
that place-at	soil-TC	exist-POL.

   'There is soil'

4. A: (the researcher's sentence)
ku kos-ey- nun	*salang-to*	*kkwum-to*	*eps-eyo*
that place-at-TC	love-also	dream-also	not exist-POL.

   'There is neither love nor dream'

B: (the subjects' respond sentence)
ku kos-ey   *kkwum-un*   *iss-eyo"*
that place-at   dream-TC   exist-POL.

'There is a dream'

5. A: (the researcher's sentence)
ku kos-ey- nun   *kwukum-to*   *salm-to*   *eps-eyo*
that place-at-TC   death-also   life-also   not exist-POL.

'There is neither death nor life'

B: (the subjects' respond sentence)
ku kos-ey   *salm-u*   *iss-eyo"*
that place-at   life-TC   exist-POL.

'There is life'

6. A: (the researcher's sentence)
ku kos-ey- nun   *palam-to*   *pi-to*   *eps-eyo*
that place-at-TC   wind-also   rain-also   not exist-POL.

'There is neither wind nor rain'

B: (the subjects' respond sentence)
ku kos-ey   *pi-nun*   *iss-eyo"*
that place-at   rain-TC   exist-POL.

'There is rain'

7. A: (the researcher's sentence)
ku kos-ey- nun   *paykil-to*   *tols-to*   *eps-eyo*
that place-at-TC   one hudreth day-also   the first birthday-also not exist-POL.

'There is neither one hundredth day (party) nor the first birthday (party)'

B: (the subjects' respond sentence)
ku kos-ey   *tols-nun*   *iss-eyo"*
that place-at   the first birthday-TC   exist-POL.

'There is the first birthday'

8. *A:* (the researcher's sentence)
    ku   kos-ey- nun   pinwu-to   mwul-to   eps-eyo
    that place-at-TC   soap-also   water-also   not exist-POL.

    'There is neither soap nor water'

    B: (the subjects' respond sentence)
    ku kos-ey   mwul-un   iss-eyo"
    that place-at   water-TC   exist-POL.

    'There is water'

9. *A:* (the researcher's sentence)
    ku   kos-ey- nun   ilkop-to   yeotelp-to   eps-eyo
    that place-at-TC   seven-also   eight-also   not exist-POL.

    'There is neither seven nor eight'

    B: (the subjects' respond sentence)
    ku kos-ey   yeptelp-un   iss-eyo"
    that place-at   eight-TC   exist-POL.

    'There is eight'

10. *A:* (the researcher's sentence)
    ku   kos-ey- nun   pisek-to   mwudem-to   eps-eyo
    that place-at-TC   tombstone-also   grave-also   not exist-POL.

    'There is neither tombstone nor grave'

    B: (the subjects' respond sentence)
    ku kos-ey   mwudem-un   iss-eyo"
    that place-at   grave-TC   exist-POL.

    'There is a grave'

11. *A:* (the researcher's sentence)
    ku   kos-ey- nun   sichey-to   neks-to   eps-eyo
    that place-at-TC   corpse-also   soul-also   not exist-POL.

    'There is neither corpse nor soul'

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B: (the subjects' respond sentence)
ku kos-ey   *neks-un*   *iss-eyo"*
that place-at   grave-TC   exist-POL.

'There is soul'

12. A: (the researcher's sentence)
 ku kos-ey- nun *pom-to* *kaul-to* *eps-eyo*
 that place-at-TC spring-also autumn-also not exist-POL.

 'There is neither spring nor autumn'

B: (the subjects' respond sentence)
 ku kos-ey   *kaul-un*   *iss-eyo"*
 that place-at   autumn-TC   exist-POL.

 'There is autumn'

13. *A:* (the researcher's sentence)
 ku kos-ey- nun *hyuka-to* *saks-to* *eps-eyo*
 that place-at-TC vacation-also wage-also not exist-POL.

 'There is neither vacaion nor wage'

B: (the subjects' respond sentence)
 ku kos-ey   *saks-un*   *iss-eyo"*
 that place-at   wage-TC   exist-POL.

 'There is autumn'

14. A: (the researcher's sentence)
 ku kos-ey- nun *sangpyo-to* *kaps-to* *eps-eyo*
 that place-at-TC brandname tag -also price-also not exist-POL.

 'There is neither brandname nor price'

B: (the subjects' respond sentence)
 ku kos-ey   *kaps-un*   *iss-eyo"*
 that place-at   price-TC   exist-POL.

 'There is price'

Sentence Type B (targeted for predicates followed by a consonant)

15. A: (the researcher's sentence)

ikes-un	*palk-un*	*i-lako*	*ha-ciyo*"
this –TC	bright	be- CI	do-POL

'It is said that small'

B: (the subjects' respond sentence)

ikes-un	*palk-ta*	*lako*	*ha-ciyo*"
this –TC	be bright	CI	do-POL

'It is said that bright'

16. A: (the researcher's sentence)

ikes-un	*cop-un*	*i-lako*	*ha-ciyo*"
this –TC	narrow	be- CI	do-POL

'It is said that narrow'

B: (the subjects' respond sentence)

ikes-un	*cop-ta*	*lako*	*ha-ciyo*"
this –TC	be narrow	CI	do-POL

'It is said that be narrow'

17. A: (the researcher's sentence)

ikes-un	*nulk-un*	*i-lako*	*ha-ciyo*"
this –TC	old	be- CI	do-POL

'It is said that old'

B: (the subjects' respond sentence)

ikes-un	*nulk-ta*	*lako*	*ha-ciyo*"
this –TC	be old	CI	do-POL

'It is said that be old'

18. A: (the researcher's sentence)

ikes-un	*noph-un*	*i-lako*	*ha-ciyo*"
this –TC	high	be- CI	do-POL

'It is said that high'

B: (the subjects' respond sentence)

ikes-un	*noph-ta*	*lako*	*ha-ciyo*"
this –TC	be high	CI	do-POL

'It is said that be high'

19. A: (the researcher's sentence)

ikes-un	*ilk-un*	*i-lako*	*ha-ciyo"*
this –TC	read	be- CI	do-POL

'It is said that read'

B: (the subjects' respond sentence)

ikes-un	*ilk-ta*	*lako*	*ha-ciyo"*
this –TC	read	CI	do-POL

'It is said that read'

20. A: (the researcher's sentence)

ikes-un	*manh-un*	*i-lako*	*ha-ciyo"*
this –TC	many	be- CI	do-POL

'It is said that many'

B: (the subjects' respond sentence)

ikes-un	*manh –ta*	*lako*	*ha-ciyo"*
this –TC	get many	CI	do-POL

'It is said that get many'

21. A: (the researcher's sentence)

ikes-un	*nalk-un*	*i-lako*	*ha-ciyo"*
this –TC	shabby	be- CI	do-POL

'It is said that shabby'

B: (the subjects' respond sentence)

ikes-un	*nalk –ta*	*lako*	*ha-ciyo"*
this –TC	b shabby	CI	do-POL

'It is said that be shabby'

22. A: (the researcher's sentence)

ikes-un	*coh-un*	*i-lako*	*ha-ciyo"*
this –TC	good	be- CI	do-POL

'It is said that good'

B: (the subjects' respond sentence)

ikes-un	*coh –ta*	*lako*	*ha-ciyo"*
this –TC	be good	CI	do-POL

'It is said that be good'

23. A: (the researcher's sentence)

ikes-un	*malk-un*	*i-lako*	*ha-ciyo"*
this –TC	clear	be- CI	do-POL

'It is said that clear'

B: (the subjects' respond sentence)

ikes-un	*malk –ta*	*lako*	*ha-ciyo"*
this –TC	be clear	CI	do-POL

'It is said that be clear'

24. A: (the researcher's sentence)

ikes-un	*nac-un*	*i-lako*	*ha-ciyo"*
this –TC	low	be- CI	do-POL

'It is said that low'

B: (the subjects' respond sentence)

ikes-un	*nac–ta*	*lako*	*ha-ciyo"*
this –TC	be low	CI	do-POL

'It is said that be low'

25. A: (the researcher's sentence)

ikes-un	*mwulk-un*	*i-lako*	*ha-ciyo"*
this –TC	weak	be- CI	do-POL

'It is said that weak'

B: (the subjects' respond sentence)

ikes-un	*mwulk–ta*	*lako*	*ha-ciyo"*
this –TC	be weak	CI	do-POL

'It is said that be weak'

26. A: (the researcher's sentence)

ikes-un	*ko-un*	*i-lako*	*ha-ciyo"*
this –TC	fine	be- CI	do-POL

'It is said that fine'

B: (the subjects' respond sentence)
ikes-un	*kop-ta*	*lako*	*ha-ciyo"*
this –TC	be fine	CI	do-POL

'It is said that be fine'

27. A: (the researcher's sentence)
ikes-un	*palp-un*	*i-lako*	*ha-ciyo"*
this –TC	tread	be- CI	do-POL

'It is said that tread'

B: (the subjects' respond sentence)
ikes-un	*palp–ta*	*lako*	*ha-ciyo"*
this –TC	tread	CI	do-POL

'It is said that tread'

28. A: (the researcher's sentence)
ikes-un	*cwuk-un*	*i-lako*	*ha-ciyo"*
this –TC	dead	be- CI	do-POL

'It is said that dead'

B: (the subjects' respond sentence)
ikes-un	*cwuk–ta*	*lako*	*ha-ciyo"*
this –TC	die	CI	do-POL

'It is said that die'

29. A: (the researcher's sentence)
ikes-un	*nelp-un*	*i-lako*	*ha-ciyo"*
this –TC	wide	be- CI	do-POL

'It is said that wide'

B: (the subjects' respond sentence)
ikes-un	*nelp–ta*	*lako*	*ha-ciyo"*
this –TC	be wide	CI	do-POL

'It is said that be wide'

30. A: (the researcher's sentence)
ikes-un	*sal-un*	*i-lako*	*ha-ciyo"*
this –TC	alive	be- CI	do-POL

'It is said that alive'

B: (the subjects' respond sentence)

ikes-un	*sal–ta*	*lako*	*ha-ciyo"*
this –TC	live	CI	do-POL

'It is said that live'

31. A: (the researcher's sentence)

ikes-un	*ccalp-un*	*i-lako*	*ha-ciyo"*
this –TC	short	be- CI	do-POL

'It is said that alive'

B: (the subjects' respond sentence)

ikes-un	*ccalp–ta*	*lako*	*ha-ciyo"*
this –TC	be short	CI	do-POL

'It is said that live'

32. A: (the researcher's sentence)

ikes-un	*pokk-un*	*i-lako*	*ha-ciyo"*
this –TC	fried	be- CI	do-POL

'It is said that fried'

B: (the subjects' respond sentence)

ikes-un	*pokk–ta*	*lako*	*ha-ciyo"*
this –TC	fry	CI	do-POL

'It is said that fry'

33. A: (the researcher's sentence)

ikes-un	*ttelp-un*	*i-lako*	*ha-ciyo"*
this –TC	astringent	be- CI	do-POL

'It is said that astringent'

B: (the subjects' respond sentence)

ikes-un	*ttelp–ta*	*lako*	*ha-ciyo"*
this –TC	be astringent	CI	do-POL

'It is said that be astringent'

34. A: (the researcher's sentence)

ikes-un	*nam-un*	*i-lako*	*ha-ciyo"*
this –TC	left	be- CI	do-POL

'It is said that left'

B: (the subjects' respond sentence)

ikes-un	*nam–ta*	*lako*	*ha-ciyo*"
this –TC	be left	CI	do-POL

'It is said that be left'

35. A: (the researcher's sentence)

ikes-un	*yalp-un*	*i-lako*	*ha-ciyo*"
this –TC	thin	be- CI	do-POL

'It is said that thin'

B: (the subjects' respond sentence)

ikes-un	*yalp–ta*	*lako*	*ha-ciyo*"
this –TC	be thin	CI	do-POL

'It is said that be thin'

36. A: (the researcher's sentence)

ikes-un	*cec-un*	*i-lako*	*ha-ciyo*"
this –TC	wet	be- CI	do-POL

'It is said that wet'

B: (the subjects' respond sentence)

ikes-un	*cec–ta*	*lako*	*ha-ciyo*"
this –TC	be wet	CI	do-POL

'It is said that be wet'

37. A: (the researcher's sentence)

ikes-un	*ulph-un*	*i-lako*	*ha-ciyo*"
this –TC	recite	be- CI	do-POL

'It is said that recite'

B: (the subjects' respond sentence)

ikes-un	*ulph–ta*	*lako*	*ha-ciyo*"
this –TC	recite	CI	do-POL

'It is said that recite'

38. A: (the researcher's sentence)

ikes-un	*cak-un*	*i-lako*	*ha-ciyo*"
this –TC	small	be- CI	do-POL

'It is said that small'

B: (the subjects' respond sentence)

ikes-un	*cak–ta*	*lako*	*ha-ciyo*"
this –TC	be small	CI	do-POL

'It is said that be small'

39. A: (the researcher's sentence)

ikes-un	*halth-un*	*i-lako*	*ha-ciyo*"
this –TC	lick	be- CI	do-POL

'It is said that lick'

B: (the subjects' respond sentence)

ikes-un	*halth–ta*	*lako*	*ha-ciyo*"
this –TC	lick	CI	do-POL

'It is said that lick'

40. A: (the researcher's sentence)

ikes-un	*kwut-un*	*i-lako*	*ha-ciyo*"
this –TC	harden	be- CI	do-POL

'It is said that harden'

B: (the subjects' respond sentence)

ikes-un	*kwut–ta*	*lako*	*ha-ciyo*"
this –TC	be harden	CI	do-POL

'It is said that be harden'

41. A: (the researcher's sentence)

ikes-un	*hwulth-un*	*i-lako*	*ha-ciyo*"
this –TC	hackle	be- CI	do-POL

'It is said that harden'

B: (the subjects' respond sentence)

ikes-un	*hwulth–ta*	*lako*	*ha-ciyo*"
this –TC	hackle	CI	do-POL

'It is said that hackle'

APPENDIX C

THE ECHO GAME TEXT IN KOREAN (에코게임 원문)

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문장 유형 A (타겟 명사가 모음앞에 나오는 경우)

1.　　A: (조사가 읽는 문장):　그곳에는 오리도 닭도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 닭은 있어요

2.　　A: (조사가 읽는 문장):　그곳에는 사자도 토끼도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 토끼는 있어요

3.　　A: (조사가 읽는 문장):　그곳에는 모래도 흙도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 흙은 있어요

4.　　A: (조사가 읽는 문장):　그곳에는 사랑도 꿈도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 꿈은 있어요

5.　　A: (조사가 읽는 문장):　그곳에는 죽음도 삶도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 삶은 있어요

6.　　A: (조사가 읽는 문장):　그곳에는 바람도 비도 없어요.

　　　B: (실험 참여자가 대답할 문장): 그곳에는 비는 있어요

7. A: (조사가 읽는 문장): 그곳에는 백일도 돓도 없어요.

   B: (실험 참여자가 대답할 문장): 그곳에는 돓은 있어요

8. A: (조사가 읽는 문장): 그곳에는 비누도 물도 없어요.

   B: (실험 참여자가 대답할 문장): 그곳에는 물은 있어요

9. A: (조사가 읽는 문장): 그곳에는 일곱도 여덟도 없어요.

   B: (실험 참여자가 대답할 문장): 그곳에는 여덟은 있어요.

10. A: (조사가 읽는 문장): 그곳에는 비석도 무덤도 없어요.

    B: (실험 참여자가 대답할 문장): 그곳에는 무덤은 있어요

11. A: (조사가 읽는 문장): 그곳에는 시체도 넋도 없어요.

    B: (실험 참여자가 대답할 문장): 그곳에는 넋은 있어요

12. A: (조사가 읽는 문장): 그곳에는 봄도 가을도 없어요.

    B: (실험 참여자가 대답할 문장): 그곳에는 가을은 있어요

13. A: (조사가 읽는 문장): 그곳에는 휴가도 삯도 없어요.

    B: (실험 참여자가 대답할 문장): 그곳에는 삯은 있어요

14.   A: (조사가 읽는 문장):   그곳에는 상표도 값도 없어요.

       B: (실험 참여자가 대답할 문장): 그곳에는 값은 있어요.

문장유형 B (타겟 서술어가 자음 앞에 오는 경우)

15.   A: (조사가 읽는 문장):   이것은 밝은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 밝다 라고 하지요.

16.   A: (조사가 읽는 문장):   이것은 좁은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 좁다 라고 하지요.

17.   A: (조사가 읽는 문장):   이것은 늙은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 늙다 라고 하지요.

18.   A: (조사가 읽는 문장):   이것은 높은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 높다 라고 하지요.

19.   A: (조사가 읽는 문장):   이것은 읽은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 읽다 라고 하지요.

20.　A: (조사가 읽는 문장):　이것은 많은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 많다 라고 하지요.

21　A: (조사가 읽는 문장):　이것은 낡은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 낡다 라고 하지요.

22.　A: (조사가 읽는 문장):　이것은 좋은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 좋다 라고 하지요.

23.　A: (조사가 읽는 문장):　이것은 맑은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 맑다 라고 하지요.

24.　A: (조사가 읽는 문장):　이것은 낮은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 낮다 라고 하지요.

25.　A: (조사가 읽는 문장):　이것은 묽은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 묽다 라고 하지요

26.　A: (조사가 읽는 문장):　이것은 고은 이라고 하지요.

　　　B: (실험 참여자가 대답할 문장): 이것은 곱다 라고 하지요

27.   A: (조사가 읽는 문장):   이것은 밟은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 밟다 라고 하지요

28.   A: (조사가 읽는 문장):   이것은 죽은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 죽다 라고 하지요

29.   A: (조사가 읽는 문장):   이것은 넓은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 넓다 라고 하지요.

30.   A: (조사가 읽는 문장):   이것은 살은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 살다 라고 하지요.

31.   A: (조사가 읽는 문장):   이것은 짧은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 짧다 라고 하지요.

32.   A: (조사가 읽는 문장):   이것은 볶은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 볶다 라고 하지요.

33.   A: (조사가 읽는 문장):   이것은 떫은 이라고 하지요.

      B: (실험 참여자가 대답할 문장): 이것은 떫다 라고 하지요.

34.   A: (조사가 읽는 문장):   이것은 남은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 남다 라고 하지요.

35.   A: (조사가 읽는 문장):   이것은 얇은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 얇다 라고 하지요.

36.   A: (조사가 읽는 문장):   이것은 젖은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 젖다 라고 하지요.

37.   A: (조사가 읽는 문장):   이것은 읊은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 읊다 라고 하지요.

38.   A: (조사가 읽는 문장):   이것은 작은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 작다 라고 하지요.

39.   A: (조사가 읽는 문장):   이것은 핥은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 핥다 라고 하지요.

40.   A: (조사가 읽는 문장):   이것은 굵은 이라고 하지요.

       B: (실험 참여자가 대답할 문장): 이것은 굵다 라고 하지요.

41.　　A: (조사가 읽는 문장):　　이것은 훑은 이라고 하지요.

　　　　B: (실험 참여자가 대답할 문장): 이것은 훑다 라고 하지요.

APPENDIX D

THE NARRATIVE TEXT IN KOREAN (한국어 이야기체 문장)

지난주 주말에 시골에 계신 외할머니 댁에 갔을 때의 일이다. 삼년전에

외할아버지께서 돌아가시고 홀로되신 할머니께서는 장성한 자식을 두고도,

할아버지의 넋이 베어있는 고향땅의 흙을 밟고 살아야 한다며, 낡고 조그만

시골집에서 홀로 사시고 있다. 늙고 홀로되신 어머니 생각에, 짧고 바쁜

주말이라도 어머니와 아버지께서는 늘 할머니를 찾아 뵙는다. 평소에는 여덟살

짜리 동생 녀석만 부모님을 따라 나섰지만, 그날은 외할머니도 뵙고, 맑고 넓고,

푸른 시골 풍경도 볼 겸, 고3 인 나도, 읽고 있던 책을 뒤로하고 부모님을 따라

나섰다. 그날 아침, 어머니께서는 사촌 동생 첫아기의 돐이라며, 그 집에 잠깐

들러야 한다고 하셨다. 아기의 선물을 사기 위해 백화점에 들렀는데, 매장을 훑고

나신 어머니께서는 물건값이 너무 비싸다며 고민하셨다. 서둘러야 한다는 아버지

말씀에, 어머니는 얇고 밝은 색의 아기 원피스를 고르셨다. 선물을 들고 우리

가족은 잠시 돐잔치를 치르고 있는 사촌 이모님 댁에 들렀다. 잔치를 치르는

이모님의 얼굴이 밝고 행복해 보였다. 어머니의 말씀에 의하면, 사촌

이모님께서는 형제가 여덟이나 되서, 어려서 고생을 많이 했다고 하셨다. 잠시후,

우리 가족은 다시 할머니 댁으로 향했다. 복잡한 도심을 벗어나, 넓은 들판이

보이는 시골길을 한참 달리고 있을 때, 우리 가족은 또 한번 차를 멈췄다. 길

한쪽에 커다란 개 한마리가 다친 듯, 버둥거리고 있었다. 우리 가족은 그 개를

자세히 들여다 보았다. 놀랍게도, 그 개의 품안에는 서너마리의 새끼들이 안겨져

있었고, 인기척에 으르렁 거리며, 그 개는 연신 새끼들을 핥고 있었다.

APPENDIX E

THE FULL TEXT FOR SENTENCE READING

1. *ku cip-ey-nun*   *oli-to*   *talk-to*   *eps-ess-ta*
   that house-at-TC   duck-also   chicken-also   not exist-Past-Dec.

   'There was no duck and no chicken I the house.'

2. *ku kos-ey-nun*   *mole-to*   *hulk-to*   *eps-ess-ta*
   that place-at-TC   sand-also   soil-also   not exist-Past-Dec.

   'There was no sand and no soil in the place.'

3. *chenkwuk-ey-nun*   *cwukum-to*   *salm-to*   *eps-ta*
   heaven-at-TC   death-also   life-also   not exist-Dec

   'There is no death and no life in heaven.'

4. *ku maul-ey-nun*   *enduk-to*   *kols-to*   *epess-ta*
   that town-at-TC   hill-also   valley-also   not exist-Dec.

   'There was no hill and no valley.'

5. *ku aki-eykey-nun*   *paykil-to*   *tols-do*   *eps-ess-ta*
   that baby-to-TC   one hundredth day-also   the first birthday-also   not exist-Dec.

   'There was no hundredth day and the first birthday.'

6. *ku salam-eykey-nun,*   *ilkop-to*   *yeotelp-to*   *cek-ta*
   that person-to-TC   seven-also   eight-also   small-Dec.

   ' For him/her, both seven and eight are small.'

7. *ku kos-ey-nun*   *sihey-to*   *neks-to*   *eps-ess-ta*
   that place-at-TC   corpse-also   soul-also   not exist-Past-Dec.

   'There was no body and no soul in the place'

8. *ku ilkkwun-eykey-nun,*   *hyuka-to*   *saks-to*   *eps-ess-ta*
   that worker-to-TC   vacation-also   wage-also   not exist-Past-Dec

   'There was no vacation and no wages for the employee'

9. *I*   *mwulken- ey-nun*   *sangpyo-to*   *kaps-to*   *eps-ta*
   this   goods-at-TC   label-also   price-also   not exist-Dec

'There is no brandname tag and no price tag.

10. *nwukwun-ka*   *hanul-i*   *palk-ta*   *lako*   *malhay-ss-ta*
    somebody-Nom.   sky-Nom.   be bright   CI   say-Past-Dec.

   'Somebody said that the sky is bright.'

11. *nwukwun-ka*   *salam-I*   *nulk-ta*   *lako*   *malhay-ss-ta*
    somebody-Nom.   people-Nom.   be old   CI   say-Past-Dec.

   'Somebody said that people get old.'

12. *nwukwun-ka*   *chek-ul*   *ilk-ta*   *lako*   *malhay-ss-ta*
    somebody-Nom.   book-Acc.   read   CI   say-Past-Dec.

   'Somebody said that reading a book.'

13. *nwukwun-ka*   *mwulken-I* *nalk-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   goods-Nom.   be shabby   CI   say-Past-Dec.

   'Somebody said that the thing is shabby.'

14. *nwukwun-ka*   *hanul-I*   *malk-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   sky-Nom.   be clear   CI   say-Past-Dec.

   'Somebody said that the sky is clear.'

15. *nwukwun-ka*   *saykkkal-I* *mwulk-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   color-Nom.   be weak   CI   say-Past-Dec.

   'Somebody said that the color is weak.'

16. *nwukwun-ka*   *ttang-ul*   *palp-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   earth-Acc.   Tread   CI   say-Past-Dec.

   'Somebody said that tread the earth.'

17. *nwukwun-ka*   *seysang-I*   *nelp-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   world-Nom.   be wide   CI   say-Past-Dec.

   'Somebody said that the world is wide'

18. *nwukwun-ka*   *pascwul-I*   *ccalp-ta*   *lako* *malhayssta*
    somebody-Nom.   rope-Nom.   be short   CI   say-Past-Dec.

'Somebody said that the rope is short'

19. *nwukwun-ka*   *kam-I*   *ttelp-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   persimon-Nom.   be astringent   CI   say-Past-Dec.

'Somebody said that persimmon is astringent.'

20. *nwukwun-ka*   *oskam-I*   *yalp-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   cloth-Nom.   be thin   CI   say-Past-Dec.

'Somebody said that the cloth is thin'

21. *nwukwun-ka*   *sico-ul*   *ulph-ta*   *lako* *malhay-ss-ta*
    somebody-Nom.   poem-Acc.   recite   CI   say-Past-Dec.

'Somebody said that recite poetry'

22. *nwukwun-ka*   *cepsi-ul*   *halth-ta*   *lako* *malhayssta*
    somebody-Nom.   dish-Acc.   lick   CI   say-Past-Dec.

'Somebody said that lick the dish'

23. *nwukwun-ka*   *pyeisak-ul*   *hwulth-ta*   *lako* *malhayssta*
    somebody-Nom.   rice-Acc.   hackle .   CI   say-Past-Dec.

'Somebody said that hackle rice'

24. *nollapkeyto,*   *oli-ka*   *talk- i*   *toy-ess-ta*
    surprisingly   duck-Nom   chicken-Com become-Past-Dec.

'Surprisingly, duck became chicken'

25. *hongswu-ttaymwuney,*   *pawuy-ka*   *hulk- i*   *toy-ess-ta*
    foold-because of   rock-Nom   soil-Com become-Past-Dec.

'Because of the flood, rock became soil'

26. *ku kaswu-eykey-nun*   *nole-ka*   *salm- i*   *toy-ess-ta*
    that singer-to-TC   song-Nom   life-Com   become-Past-Dec.

    ' For the singer, song became life'

27. *myechil-hwu,*   *aki-ka*   *tols- i*   *toy-ess-ta*
    several days-later   baby-Nom   the first birthday-Com become-Past-Dec.

    'Later, the baby became one year old.'

28. *ku ai-uy*   *nai-ka*   *yeotelp-I*   *toy-ess-ta*
    that child-Poss.   age-Nom   eight-Com become-Past-Dec.

    'The child became eight years old.'

29. *samwuchin*   *pwunno-ka*   *neks-I*   *toy-ess-ta*
    deeply reside   fury-Nom   soul-Com   become-Past-Dec.

    'Deep fury became soul.'

30. *ku sicel-ey-nun*   *poilssal-i*   *saks*   *i-ess-ta*
    that times-at-TC   barlyey-Nom. wage   be-Past-Dec.

    'At that time, barley was a wage.'

31. *myeungpwum-un*   *sangpyo-ka* *kaps- i*   *toy-n-ta*
    brandname-TC   label-Nom.   price-Com   become-Dec.

    'Brand name became price'

32. *nwukwun-ka*   *palk-ko*   *malk-un* *hanul* *ilako*   *malhay-ss-ta*
    somebody-Nom   *bright-and* *clear*   *sky*   *CI*   *say-Past-Dec.*

    'Somebody said that bright and clear sky.'

33. *nwukwun-ka*   *nulk-ko*   *nalk-un* *salam* *ilako*   *malhay-ss-ta.*
    somebody-Nom   old-and   shabby person CI   say-Past-Dec.

    'Somebody said that old and shabby man.'

34. *nwukwun-ka*   *nalk-ko*   *ilk-un* *chayk* *ilako*   *malhay-ss-ta*
    somebody-Nom   shabby-and read   book   CI   say-Past-Dec.

    'Somebody said that shabby and read book.'

35. *nwukwun-ka*   *yalp-ko*   *ccalp-un*   *mwulken*   *ilako*   *malhay-ss-ta*
     somebody-Nom   thin-and   short   goods   CI   say-Past-Dec.

'Somebody said that thin and short thing.'

36. *nwukwunka*   *malk-ko*   *palk-un*   *hanul*   *ilako*   *malhay-ss-ta.*
     somebody-Nom   clear-and   bright   sky   CI   say-Past-Dec.

'Somebody said that clear and bright sky.'

37. *nwukwun-ka*   *mwulk-ko*   *nulk-un*   *saykkkal*   *ilako*   *malhay-ss-ta.*
     somebody-Nom   weak-and   shabby   color   CI   say-Past-Dec.

'Somebody said that weak and old color'

38. *nwukwun-ka*   *ilk-ko*   *palp-un*   *congi*   *lako*   *malhay-ss-ta.*
     somebody-Nom   read-and   tread   paper   CI   say-Past-Dec.

'Somebody said that read and trodden paper.'

39. *nwukwun-ka*   *nelp-ko*   *yalp-un*   *seysang*   *ilako*   *malhay-ss-ta.*
     somebody-Nom   wide-and   thin   world   CI   say-Past-Dec.

'Somebody said that wide and thin world.'

40. *nwukwun-ka*   *ccalp-ko*   *nelp-un*   *pascwul*   *ilako*   *malhay-ss-ta.*
     somebody-Nom   short-and   wide   rope   CI   say-Past-Dec.

'Somebody said that short and wide rope.'

41. *nwukwun-ka*   *ttelp-ko*   *mwulk-un*   *hongsi*   *lako*   *malhay-ss-ta.*
     somebody-Nom   astringent-and   weak   persimon   CI   say-Past-Dec.

'Somebody said that astringent and weak persimmon.'

42. *nwukwun-ka*   *yalp-ko*   *ttelp-un*   *kockam*   *ilako*   *malhay-ss-ta.*
     somebody-Nom   thin-and   astringent   dried persimon   CI   say-Past-Dec.

'Somebody said that thin and astringent dried persimmon.'

43. *nwukwun-ka*   *ulph-un*   *si-lul*   *ulph-ko iss-ta.*
     somebody-Nom   recite   poem-Acc.   recite-progressive-Dec.

'Somebody is reciting (already) recited poem.'

44. *nwukwun-ka*   *halth-un*   *cepsi-lul*   *halth-ko iss-ta.*
     somebody-Nom   lick   dish-Acc.   lick-progressive-Dec.

'Somebody is liking a dish.that is licked '

45. *nwukwun-ka*   *hwulth-un*   *polipath-ul*   *hwulth-ko iss-ta.*
     somebody-Nom   hackle   barley field-Acc.   hackle-progressive-Dec.

'Somebody is hackling barley field that is hackled.'

APPENDIX F

THE TEXT FOR SENTENCE READING IN KOREAN (한국어 문장)

1. 그 집에는 오리도 닭도 없다.

2. 그곳에는 모래도 흙도 없다.

3. 천국에는 죽음도 삶도 없다.

4. 그 마을에는 언덕도 곬도 없다.

5. 그 아기에게는 백일도 돐도 없었다.

6. 그 사람에게는 일곱도 여덟도 적다.

7. 그곳에는 시체도 넋도 없다.

8. 그 일꾼에게는 휴가도 삯도 없었다.

9. 이 물건에는 상표도 값도 없다.

10. 누군가 하늘이 밝다 라고 말했다.

11. 누군가 사람이 늙다 라고 말했다.

12. 누군가 책을 읽다 라고 말했다.

13. 누군가 물건이 낡다 라고 말했다.

14. 누군가 하늘이 맑다 라고 말했다.

15. 누군가 색깔이 묽다 라고 말했다.

16. 누군가 땅을 밟다 라고 말했다.

17. 누군가 세상이 넓다 라고 말했다.

18. 누군가 밧줄이 짧다 라고 말했다.

19. 누군가 감이 떫다 라고 말했다.

20. 누군가 옷감이 얇다 라고 말했다.

21. 누군가 시조를 읊다 라고 말했다.

22. 누군가 접시를 핥다 라고 말했다.

23. 누군가 벼이삭을 훑다 라고 말했다.

24. 놀랍게도, 오리가 닭이 되었다.

25. 홍수때문에, 바위가 흙이 되었다.

26. 그 가수에게는 노래가 삶이 되었다.

27. 며칠후, 아기가 돐이 되었다.

28. 그 아이의 나이가 여덟이 되었다.

29. 사무친 분노가 넋이 되었다.

30. 그 시절에는 보리쌀이 삯이 었다.

31. 명품은 상표가 값이 되는 것이다.

32. 누군가 밝고 맑은 하늘 이라고 말했다.

33. 누군가 늙고 낡은 사람이라고 말했다.

34. 누군가 낡고 읽은 책이라고 말했다.

35. 누군가 얇고 짧은 물건이라고 말했다.

36. 누군가 맑고 밝은 하늘 이라고 말했다.

37. 누군가 묽고 늙은 색깔 이라고 말했다.

38. 누군가 읽고 밟은 종이 라고 말했다.

39. 누군가 넓고 얇은 세상 이라고 말했다.

40. 누군가 짧고 넓은 밧줄이라고 말했다.

41. 누군가 떫고 묽은 홍시 라고 말했다.

42. 누군가 얇고 떫은 곶감 이라고 말했다.

43. 누군가 읊은 시를 읊고 있다.

44. 누군가 핥은 접시를 핥고 있다.

45. 누군가 훑은 보리밭을 훑고 있다.

APPENDIX G

THE WORD LIST IN KOREAN (한국어 단어 목록)

1. 닭이   2. 흙이

3. 삶이   4. 돐이

5. 여덟이   6. 넋이

7. 삯이   8. 값이

9 밝다   10. 늙다

11. 읽다   12. 낡다

13. 맑다   14. 묽다

15. 밟다   16. 넓다

17. 짧다   18. 떫다

19. 얇다   20. 읊다

21. 핥다   22. 훑다

APPENDIX H

SCORE SHEET

1. Score sheet for the task 1 (echo game)

Subject # _____   Round # _____

Korean <u>Pronunciation</u> used:

1. 'chicken+un (topic marker)': ta-kun (   ) tal-kun (   ) tak-un (   ) other _____

2. 'soil+ un': hu-kun (   ) hul-kun (   ) hulk-un (   ) other _____

3. 'life+ un': sa-mun (   ) sal-mun (   ) salm-un (   ) other _____

4. 'the first birthday + un': to-lun (   ) tol-sun (   ) tolt-un (   ) other __

5. 'eight +un': yeote-lun (   ) yeotel-pun yeotelp-un (   ) other _____

6. 'soul +un': ne-kun (   ) nek-sun (   )   other _____

7. 'wage+ un': sa-kun (   ) sak-sun (   )   other _____

8. 'price+ un': ka-pun (   ) kap-sun (   )   other _____

9. 'bright': pak-ta (   )   pal-ta (   ) palk-ta (   )   other _____

10. 'get old': nuk-ta (   ) nul-ta (   ) nulk-ta (   )   other _____

11. 'read': ik-ta (   ) il-ta (   )   ilk-ta (   )   other _____

12. 'shabby': nal-ta (   ) nak-ta (   ) nalk-ta (   )   other _____

13. 'clear': mak-ta (   ) mal-ta (   ) malk-ta (   ) other _____

14. 'weak' :mwul-ta (   ) mwuk-ta (   ) mwulk (   ) other _____

15. 'tread': pap-ta (   ) pal-ta (   ) palp-ta (   )   other _____

16. 'wide': nep-ta (   ) nel-ta (   ) nelp-ta (   )   other _____

17. 'short': ccap-ta (   ) ccal-ta (   ) ccalp-ta (   ) other _____

18. 'astringent': ttel-ta (   ) ttep-ta (   ) ttelp-ta (   ) other _____

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19. 'thin': yap-ta ( ) yal-ta ( ) yalp-ta ( )   other _____

20. 'recite': up-ta ( ) us-ta ( ) ups-ta ( )   other _____

21. 'lick': hal-ta ( ) hat-ta ( ) halth-ta ( ) other _____

22. 'hackle': hwut-ta ( ) hwul-ta ( ) hwult-ta ( ) other _____

2. Score sheet for the task 2(reading narrative text)

Subjects # _____   **Round #** _____

Korean <u>Pronunciation</u> used:

1. 'soul+ i(subject marker)' : ne-ki ( ) nek-si ( ) other _____

2. 'soil+ ul (accusative marker)': hu-kul ( ) hul-kul ( ) other _____

3. 'tread+ko(and)': pap-ko ( ) pal-ko ( ) palp-ko ( )   other _____

4. 'shabby+ko (and)': nak-ko ( ) nal-ko ( ) nalk-ko ( ) other _____

5. 'get old+ko': nuk-ko ( ) nul-ko ( ) nulk-ko ( )   other _____

6. 'short+ko': ccap-ko ( ) ccal-ko ( ) ccalp-ko ( )   other _____

7. 'eight+sal (years)': yeotep-sal ( ) yeotel-sal ( ) yeotelp-sal ( ) other _____

8. 'clear+ ko': mak-ko ( ) mal-ko ( ) malk-ko ( ) other _____

9. 'wide+ko': nep-ko ( ) nel-ko ( ) nelp-ko ( )   other_____

10. 'read+ko': ik-ko ( ) il-ko ( )   ilk-ko ( )   other _____

11. 'the first birthday +i (be)': to-li ( ) tol-si ( )   other _____

12. 'hackle+ko': hwut-ko ( ) hwul-ko ( ) hwult-ko ( ) other _____

13. 'price+i': ka-pi ( ) kap-si ( )   other _____

14. 'thin+ko': yap-ko ( ) yal-ko ( ) yalp-ko ( )   other _____

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15. 'bright+un': pal-kun ( ) pal-lun ( ) palk-un ( )   other _____

16. 'bright+ko': pak-ko ( ) pal-ko ( ) palk-ko ( )   other _____

17. 'eight+ina': yeote-lina ( ) yeotel-pina ( )   other _____

18. 'wide+un': nel-pun ( ) nel-lun ( ) nelp-un ( )   other_____

19. 'lick+ko': hat-ko ( ) hal-ko ( ) halt-ko ( ) other _____

3. Score sheet for the task 3 (reading short sentences)

Subject # _____   Round #_____

Korean Pronunciation used:

1. 'chicken': tak (   )   tal (   )   talk ( ) other _____

2. 'soil': huk ( )   hul (   )   hulk ( ) other _____

3. 'life': sam ( )   sal (   )   salm ( ) other _____

4. 'valley' : kol ( )   kos ( )   kols ( ) other _____

5. 'the first birthday': tol ( )   tos ( )   tols ( ) other _____

6. 'eight': yeotel ( ) yeotep ( )   yeotelp ( ) other _____

7. 'soul' : nek ( )   nes ( )   neks ( ) other _____

8. 'wage' :sak ( )   sas ( )   saks ( ) other _____

9. 'price': kap ( )   kas ( )   kaps ( ) other _____

10. 'bright': pak-ta ( )   pal-ta ( ) palk-ta ( )   other _____

11. 'get old': nuk-ta ( ) nul-ta ( ) nulk-ta ( )   other _____

12. 'read': ik-ta ( ) il-ta ( )   ilk-ta ( )   ꜱ other _____ .. .

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13. 'shabby': nal-ta ( ) nak-ta ( ) nalk-ta ( )   other _____

14. 'clear': mak-ta ( ) mal-ta ( ) malk-ta ( ) other _____

15. 'weak' :mwul-ta ( ) mwuk-ta ( ) mwulk ( ) other _____

16. 'tread': pap-ta ( ) pal-ta ( ) palp-ta ( )   other _____

17. 'wide': nep-ta ( ) nel-ta ( ) nelp-ta ( )   other _____

18. 'short': ccap-ta ( ) ccal-ta ( ) ccalp-ta ( ) other _____

19. 'astringent': ttel-ta ( ) ttep-ta ( ) ttelp-ta ( ) other _____

20. 'thin': yap-ta ( ) yal-ta ( ) yalp-ta ( )   other _____

21. 'recite': up-ta ( ) us-ta ( ) ups-ta ( )   other _____

22. 'lick': hal-ta ( ) hat-ta ( ) halth-ta ( )   other _____

23. 'hackle': hwut-ta ( ) hwul-ta ( ) hwult-ta ( ) other _____

24. chicken + i (subject marker) : ta-ki ( ) tal-ki ( ) ta-li ( ) other _____

25. soil+ i: hu-ki ( ) hul-ki ( ) hu-li ( )   other _____

26. life+ i: sal-mi ( ) sa-mi ( ) sa-li ( )   other _____

27. the first birthday + i : to-li ( ) tol-si ( ) to-si ( ) other __

28. eight +i: yeote-li ( ) yeotel-pi yeote-pi ( )   other _____

29. soul +i: ne-ki ( ) nek-si ( ) ne-si ( )   other _____

30. wage+ i: sa-ki ( ) sak-si ( ) sa-si ( )   other _____

31. price+ i: kap-si ( ) ka-pi ( ) ka-si ( )   other _____

32. 'bright+ ko (and)': pal-ko ( ) pak-ko ( ) palk-ko

    clear+ un (adjectival marker):mal-kun ( ) ma-kun ( ) ma-lun ( )

33. get old+ ko: nuk-ko ( ) nul-ko ( ) nulk-ko ( ) other _____

shabby+ un: nal-kun ( ) na-kun ( ) na-lun ( )

34. shabby+ ko: nak-ko ( ) nal-ko ( ) nalk-un ( ) other _____

    get old+ un: nul-kun ( ) nul-lun ( ) nulk-un ( ) other _____

35. thin+ko: yap-ko ( ) yal-ko ( ) yalp-ko ( ) other _____

    short + un: ccal-pun ( ) ccal-lun ( ) ccalp-un ( ) other _____

36. clear+ ko: mak-ko ( ) mal-ko ( ) malk-ko ( ) other _____

    bright+un: pal-kun ( ) pal-lun ( ) palk-un ( ) other _____

37. weak+ ko: mwuk-ko ( ) mwul-ko ( ) mwulk-ko ( ) other _____

    old+un: nul-kun ( ) nul-lun ( ) nulk-un ( ) other _____

38. read+ko: ik-ko ( ) il-ko ( ) ilk-ko ( ) other _____

    tread +un: pal-pun ( ) pal-lun ( ) palp-un ( ) other _____

39. wide+ko: nep-ko ( ) nel-ko ( ) nelp-ko ( ) other _____

    thin+un: yal-pun ( ) yal-lun( ) yalp-un ( ) other _____

40. short+ ko: ccap-ko ( ) ccal-ko ( ) ccalp-ko ( ) other _____

    wide+un: nel-pun ( ) nel-lun ( ) nelp-un ( ) other _____

41. astringent+ko: ttep-ko ( ) ttel-ko ( ) ttelp-ko ( ) other _____

    weak+ un: mwul-kun ( ) mwul-lun ( ) mwulk-un ( ) other _____

42.thin+ko: yap-ko ( ) yal-ko ( ) yalp-ko ( ) other _____

    astringent+ un: ttel-pun ( ) ttel-lun ( ) ttelp-un ( ) other _____

43. recite+un: ul-phun ( ) ul-lun ( ) ulp-un ( ) other _____

    recite+ko: up-ko ( ) ul-ko ( ) ulp-ko ( ) other _____

44. lick+un: hal-thun ( ) hal-lun ( ) halth-un ( ) other _____

lick+ko: hat-ko ( ) hal-ko ( ) halt-ko ( ) other _____

45. hackle+un: hwul-thun ( ) hwul-lun ( ) hwult-un ( ) other _____

hackle+ko: hwut-ko ( ) hwul-ko ( ) hwult-ko ( ) other _____

4. Score sheet for the task 4(reading the words)

Subject # _____   **Round #** _____

Korean <u>Pronunciation</u> used:

1. chicken + i (subject marker) : ta-ki ( ) tal-ki ( ) ta-li ( ) other ____

2. soil+ i: hu-ki ( ) hul-ki ( ) hu-li ( ) other _____

3. life+ i: sal-mi ( ) sa-mi ( ) sa-li ( ) other _____

4. the first birthday + i : to-li ( ) tol-si ( ) to-si ( ) other ___

5. eight +i: yeote-li ( ) yeotel-pi yeote-pi ( ) other _____

6. soul +i: ne-ki ( ) nek-si ( ) ne-si ( ) other _____

7. wage+ i: sa-ki ( ) sak-si ( ) sa-si ( ) other _____

8. price+ i: kap-si ( ) ka-pi ( ) ka-si ( ) other _____

9. 'bright': pak-ta ( ) pal-ta ( ) palk-ta ( ) other _____

10. 'get old': nuk-ta ( ) nul-ta ( ) nulk-ta ( ) other _____

11. 'read': ik-ta ( ) il-ta ( ) ilk-ta ( ) other _____

12. 'shabby': nal-ta ( ) nak-ta ( ) nalk-ta ( ) other _____

13. 'clear': mak-ta ( ) mal-ta ( ) malk-ta ( ) other _____

14. 'weak' :mwul-ta ( ) mwuk-ta ( ) mwulk ( ) other _____

15. 'tread': pap-ta ( ) pal-ta ( ) palp-ta ( )   other _____

16. 'wide': nep-ta ( ) nel-ta ( ) nelp-ta ( )   other_____

17. 'short': ccap-ta ( ) ccal-ta ( ) ccalp-ta ( ) other _____

18. 'astringent': ttel-ta ( ) ttep-ta ( ) ttelp-ta ( ) other _____

19. 'thin': yap-ta ( ) yal-ta ( ) yalp-ta ( )   other _____

20. 'recite': up-ta (   ) us-ta ( ) ups-ta ( )   other _____

21. 'lick': hal-ta (   ) hat-ta (   ) halth-ta (   ) other _____

22. 'hackle': hwut-ta ( ) hwul-ta (   ) hwult-ta (   ) other _____

APPENDIX I

BACKGROUND QUESTIONNAIRE

Questionnaire

Code: _____ Date: ____ Location _____

1. Sex of interviewee: male ___ female___

2. When were you born?(ex:1973) _____

3. Your level of education?

( ) middle school graduate or less

( ) high school graduation or less

( ) college graduation or less

( ) graduate school

( ) other

4. What is your occupation?

( ) office worker   ( ) public service

( ) self-employed   ( ) student

( ) other

5. What is father's occupation?

( ) office worker   ( ) public service

( ) self-employed   ( ) student

( ) other

6. Your father's level of education?

( ) middle school graduate or less

( ) high school graduation or less

( ) college graduation or less

( ) graduate school

( ) other

7. Where were you born?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

8. Where did you get started your elementary school education?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

9. Where do you live now?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

10. What dialect do you speak?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

11. What dialect does your father speak?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

12. What does your mother speak?

( ) Seoul or Kyunggi   ( ) Kangwon

( ) Chwungcheng   ( ) Chenla

( ) Kyengsang   ( ) Chaeju

( ) Pyengan   ( ) Whanghae

( ) Hamkyeng

13. Have you ever taken any pronunciation-related training? (ex: public speech training)

No _____

Yes _____ (what kind?   )

14. How do you think of your accuracy of Korean pronunciation?

Inaccurate less accurate normal accurate very accurate

←( )---( )—( )—( )—( )→

15. How do you think of the importance of accuracy pronunciation of Korean?

Unimportant less important   normal   important   very important

←(   )---(   )—(   )—(   )—(   )→

16. Do you have any physical disadvantages causing difficulties in pronunciation of

Korean?

Yes____ (what kind?   )

No ____

APPENDIX J

BACKGROUND QUESTIONAIRE IN KOREAN (설문지)

● 성별: 남 _____ 여 _____

● 귀하가 태어나신 연도는? (예:1973 년도) _____년도

● 귀하의 최종학력은 ?

    (   ) 중학재학 및 졸업이하   (   ) 고교재학 및 졸업이하

    (   ) 대학재학 및 졸업이하   (   ) 대학원재학 및 졸업이하

    (   ) 기타

● 귀하의 직업은 ?

    (   ) 회사원   (   ) 공무원   (   ) 자영업

    (   ) 전문직, 학생   (   ) 기타

● 귀하의 아버지의 직업은 (혹은 어머니의 직업)?

    (   ) 회사원   (   ) 공무원   (   ) 자영업

    (   ) 전문직, 학생   (   ) 기타

● 귀하의 아버지의 최종학력은?

    (   ) 중학재학 및 졸업이하   (   ) 고교재학 및 졸업이하

    (   ) 대학재학 및 졸업이하   (   ) 대학원재학 및 졸업이하

    (   ) 기타

● 귀하가 태어나신 지방은 ?

    (   ) 서울 및 경기도   (   ) 경상도   (   ) 전라도

    (   ) 충청도   (   ) 강원도   (   ) 평안도

(　　　)함경도　　　(　　　)황해도　　　(　　　)제주도

● 귀하는 어느지방에서 초등교육을 시작하셨습니까?

　　(　　　)서울 및 경기도　　(　　　)경상도　　(　　　)전라도

　　(　　　)충청도　　(　　　)강원도　　(　　　)평안도

　　(　　　)함경도　　(　　　)황해도　　(　　　)제주도

● 귀하는 현재 어느지방에 거주하십니까?

　　(　　　)서울 및 경기도　　(　　　)경상도　　(　　　)전라도

　　(　　　)충청도　　(　　　)강원도　　(　　　)평안도

　　(　　　)함경도　　(　　　)황해도　　(　　　)제주도

● 귀하는 어느지방 방언을 사용하십니까? (표준어를 사용하신는 분은 서울

　경기 지역에 표시하여 주십시요.)

　　(　　　)서울 및 경기도　　(　　　)경상도　　(　　　)전라도

　　(　　　)충청도　　(　　　)강원도　　(　　　)평안도

　　(　　　)함경도　　(　　　)황해도　　(　　　)제주도

● 귀하의 아버지는 어느지방 방언을 사용하십니까? (표준어를 사용하신는

　분은 서울 경기 지역에 표시하여 주십시요.)

　　(　　　)서울 및 경기도　　(　　　)경상도　　(　　　)전라도

　　(　　　)충청도　　(　　　)강원도　　(　　　)평안도

　　(　　　)함경도　　(　　　)황해도　　(　　　)제주도

● 귀하의 어머니는 어느지방 방언을 사용하십니까? (표준어를 사용하신는

분은 서울 경기 지역에 표시하여 주십시요.)

( ) 서울 및 경기도 ( ) 경상도 ( ) 전라도

( ) 충청도 ( ) 강원도 ( ) 평안도

( ) 함경도 ( ) 황해도 ( ) 제주도

● 현재 발음 교육을 받거나 혹은 받은 경험이 있습니까? (예: 웅변교육,

연기교육, 등등)

( ) 예 _____ ( ) 아니오

● 귀하는 본인의 국어발음이 얼마나 정확하다고 생각하십니까?

매우 정확하지 않다　조금정확하다　　보통이다　　정확하다　매우 정확하다

←( ) -------- ( ) -------- ( ) ------- ( ) -------- ( ) →

● 귀하는 정확한 국어 발음이 중요하다고 생각하십니까?

전혀 중요하지 않다　조금중요하다　　보통이다　　중요하다　매우 중요하다

←( ) -------- ( ) -------- ( ) ------- ( ) -------- ( ) →

● 국어 발음을 하는데에 어려움을 주는 건강상의 문제가 있으십니까?

( ) 예 ( ) 아니오

감사합니다.

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