Identity avoidance and speaker preference in Korean*

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An, Young-ran. 2012. Identity avoidance and speaker preference in Korean. *Studies in Phonetics, Phonology and Morphology* 18.3. 397-412. The principle of identity avoidance, aka OCP, is universally attested in many unrelated languages. This paper introduces such a case from Korean, which is curious in that it does not simply obey the principle of identity avoidance in a categorical manner. At issue with this principle is variation in speakers' preferences, which seems to be still one of the factors in operation toward gradience in a phonological phenomenon. In a type of total reduplication in Korean, a consonant is inserted in the onset position of the first syllable of a reduplicant, e.g. allok-**t**allok. Based on the data from a dictionary and a word creation experiment, the inserted consonants were found inclinable to the identity avoidance principle. Besides, the experiment showed that speakers prefer to have certain consonants as inserted consonants, irrespective of identity avoidance, which contributes to the non-categorical tendency of identity avoidance. **(Korea Christian University)**

Keywords: identity avoidance, categorical, speakers' preferences, gradience

1. Introduction

Korean has a number of ideophones which consist of reduplicated forms and are used to express onomatopoeia. The reduplicant and base are generally identical (1), but the reduplicant can have an inserted consonant when the base is vowel-initial (2).[1]

(1) a. mik'ɨl-mik'ɨl 'slippery'
b. p^halɨt-p^halɨt 'verdant'
c. okɨl-okɨl 'simmering'
d. umul-umul 'mumblingly'

(2) a. als'oŋ-**t**als'oŋ 'confusing'
b. allok-**t**allok 'dappled'
c. umul-**ʧ**'umul 'hesitantly'
d. ulak-**p**ulak 'roughly'
e. osun-**t**osun 'harmonious'
f. aki-**ʧ**aki 'charming'

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[1] I use the phonemic transcription throughout the paper, not the phonetic one. The reduplicant is underlined and an inserted consonant is indicated in bold type.

The reduplicative consonant can be alveolar (2a, b, e), bilabial (2d), or palatal (2c, f), and it can be a stop (2a, b, d, e), or an affricate (2c, f).

I determined the base and reduplicant through the diagnostic of whether a component of a reduplicated form can stand alone (cf. Jun and Lee 2006). According to Jun and Lee (2006), examples (2a-c) above fall under their Type II in which only the first portion can be used independently and therefore it is considered a base of the reduplicative form. Meanwhile, examples (2d-f) come under their Type IV in which neither portion of a reduplicated form exists for itself. I included the latter type in my discussion as similar to the former type based on one of the universal principles in phonology and the unmarked syllable structure CV which require a syllable onset in the unmarked forms like reduplicants. Thus without compelling evidence to the contrary, I assume that the reduplication of both types (Jun and Lee's Type II and IV) is a case of epenthesis.

As for the consonants that are inserted (CI), what would be possible CIs? Is it ever possible to predict what CI is epenthesized? I argue that although the choice of insertion is not completely predictable, the interpolated segment tends not to be identical to the neighbouring consonants. In section 2, I present the relevant data and background to help understand what is happening in the Korean data. Section 3 investigates the Korean CI-reduplication in detail by virtue of the dictionary study and experiment results. Section 4 discusses general and specific implications of the results. Section 5 summarizes the findings and concludes the paper.

2. Background

The consonant appearing in the CI position is a usual onset consonant that is allowed in Korean. It can be any consonant from Table 1, except for /ŋ/ that is not allowed in the onset of a syllable, which is a language-universal phenomenon.[2, 3]

[2] Korean differentiates obstruents in terms of aspiration and tenseness. Therefore, there are three kinds of [-continuant] obstruents, i.e. lenis, aspirated, and fortis. However, for the purpose of this paper I treat them as one sound sharing the same place and manner since I only consider the two factors, place and manner in the current paper. For instance, /p, p^h, p'/ will be counted as a single type of consonant.

[3] Some claim that /w/ and /j/ in Korean are a part of the nucleus (Kim-Renaud 1978, Choe 1986, Sohn 1987, Kim and Kim 1991), whereas others argue that they are part of the onset (Lee 1982, Ahn 1986, Lee 1993, Kim 1998). I adopt the latter view in this paper.

Table 1. Consonant phoneme inventory of Korean

Manner \ Place	Bilabial	Alveolar	Palatal	Velar	Glottal
Stop	p p^h p’	t t^h t’		k k^h k’	
Affricate			ʧ $ʧ^h$ ʧ’		
Nasal	m	n		ŋ	
Fricative		s s’			h
Approximant	(w)	l	(j)		

Out of these possible candidates for insertion in reduplication, can we ever predict what consonant is to be chosen in a certain context? One possibility is that speakers would insert a consonant that does not have the same features as other consonants of the base. A good example of this kind is from the Turkish reduplication. Turkish emphatic adjectives are created by prefixing a CVC syllable where the initial CV is identical to the word-initial CV of the base, and the final C comes from the set /p, s, m, r/ (Yu 1999, Wedel 1999, 2000). This inserted consonant of the reduplicant tends to be non-identical to the first two consonants of the base.

(3) Turkish emphatic reduplication

a.	kara	‘dark’	kapkara	‘pitch black’
b.	belli	‘clear’	besbelli	‘obvious’
c.	bejaz	‘white’	bembejaz	‘bright white’
d.	temiz	‘clean’	tertemiz	‘spotless’

In a reduplicated form C_1V_1 {**p**, **s**, **m**, (**r**)} $C_1V_1C_2$…, Wedel argues that (i) /p/ is not selected if C_1 in CV**C**-C_1VC_2V is labial; (ii) The inserted consonant must be non-identical to either C_1 or C_2 of the base; (iii) Except where contravened by (i) and (ii), /p/ is selected over /m/ or /s/.[4] Therefore, the preferred segment is /p/, but it is blocked from occurring when either of the base consonants, C_1 or C_2, is /p/.

Similar patterns can be observed in other languages, e.g. Cantonese and Javanese (Yip 1996). The Cantonese language game “La-Mi” typically changes the first consonant of the input into /l/ and second vowel into /i/ as in (4a). However, when the input already has /l/ or /i/, a different consonant

[4] Among the consonants for insertion, /r/ is not inserted as productively as the others. Hence it comes in parentheses. In fact, Wedel observes that /r/ exists only in the lexicon and it is not favoured in Turkish speakers’ creation of reduplicative forms.

and vowel are to be used as in (4b).

(4) Cantonese La-Mi (CVC > lVC CiC)

a.	kɔ:ŋ	lɔ:ŋ kiŋ		
	sat	lat sit		
b.	t'in	lin t'un	*lin t'in	i>u
	lat	k'at lit	*lat lit	l>k'
	lin	k'in lun	*lin lin	l>k' and i>u

In Javanese habitual-repetitive reduplication, the final syllable of the first half in the reduplicative form must have nucleus /a/ as in (5a), but if the input already contains /a/ in the final syllable of the base, the vowel in the final syllable of the reduplicant will have a different quality as in (5b).

(5) Javanese habitual-repetitive reduplication

a.	eliŋ	elaŋ-eliŋ	'remember'	
	tuku	tuka-tuku	'buy'	
	eleʔ	elaʔ-eleʔ	'bad'	
b.	udan	udan-uden	'rain'	*udan-udan
	kumat	kumat-kumet	'have a relapse'	*kumat-kumat
	edan	edan-eden	'crazy'	*edan-edan

Based on this well-established background of reduplication and identity avoidance in epenthesis of segments, I investigate the case of Korean reduplication, looking for a preferred segment for insertion and asking what context, if any, blocks a preferred segment from occurring.

3. Korean CI-reduplication

3.1 Preferred segments and identity avoidance

Among other types of Korean reduplication, I only consider the consonant insertion cases, i.e. Jun and Lee's (2006) Type II and IV as I have discussed in section 1. A search of the dictionary (*Eysseynsu Kwuke Sacen* 2006) revealed 89 instances in which only the first half can stand alone or neither of the halves can stand by itself, e.g. oŋki-**ʧ**oŋki, ʌʧʌŋ-**p**ʌʧʌŋ.

For the purpose of seeing whether the observed pattern in the corpus would be replicated in a reduplication task, an experiment was conducted with the native speakers of Korean, in Seoul, Korea. 55 native speakers of Korean took part in the experiment.[5] The task was paper-based. The participants were presented with nonsense base morphemes that begin in a

[5] Information about the participants, including age, gender, socioeconomic status, education, and hometown, has been abstained in the paper, under the assumption that there should not be much difference among native speakers when it comes to phonological intuition (Ellen Broselow, p.c.).

V, and they were asked to add a reduplicant with an inserted C to make the most natural reduplicated form with a given base. The number of responses was 1,352 in total, except for errors and non-responses.

According to the following figure, there seems to be no clearly preferred segment. Instead, more than one segment is inserted at about the same frequency. They are /t, p, ʧ/ for the dictionary and /t, p, ʧ, k, s, m/ for the experiment of word creation. The frequency of each of these consonants accounts for more than 10%.

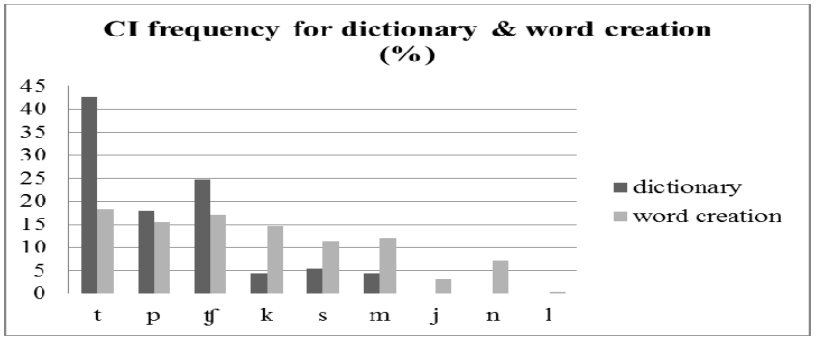

Figure 1. CIs from dictionary and word creation

When it comes to contextual effects, what context would prevent a segment from occurring in the reduplicant? In order to examine the exhaustive contextual effects of the base consonants on the choice of CIs, I took account of reduplicative forms with a VCVC-base, e.g. ʌlʌn-**t**ʌlʌn, umul-ʧ'umul, akɨn-**p**akɨn (see Appendix A for the entire list). In the dictionary data, the reduplicated forms with a VCVC base account for 32.58% (29 items out of 89), which is the greatest in number of the CI-reduplication, while VCCVC-bases amount to 20.22% (18 items), VCVCVC-bases 12.36% (11 items), VCV-bases 10.11% (9 items), VCCV-bases 8.99% (8 items), VCVCV-bases 5.62% (5 items), VCCVCV-bases 2.25% (2 items), and VVC-bases 2.25% (2 items). Each of VCCVCVCV-bases, VCVCCVC-bases, VCCCV-bases, VCCVCVC-bases, and VVCVC-bases amounts to 1.12 % (1 item).

Focusing on the VCVC-bases (see Appendix B for the stimuli in the experiment), I particularly look at those forms that contain CI classes /t, p, ʧ/, which amount to 93.1% in the dictionary (27 items out of 29) and the corresponding cases of CI classes /t, p, ʧ/ in the experiment, which account for 60.28% (472 tokens out of 783).[6]

[6] Since 15 stimuli with a VCVC base were furnished, it is computed to have 825 tokens altogether, but some erroneous responses and the cases that were not responded have been

The similarity between the three most frequent CIs /t, p, ʧ/ and their context consonants is evaluated in terms of the place and manner of articulation. I first look at the context consonant C_1 in the reduplicative form VC_1VC_2-CVCVC as compared to CI. For instance, I compare the place and manner of /t/ and /s/ in oson-toson 'harmonious' and /ʧ'/ and /m/ in umul-ʧ'umul 'hesitantly.'

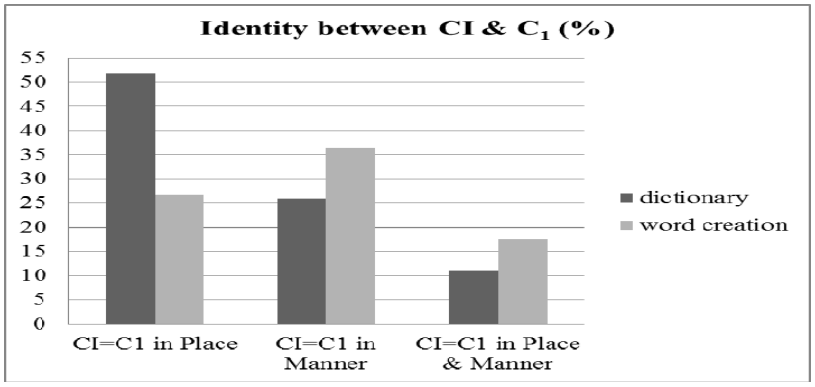

Figure 2. VC_1VC_2-CVCVC, CI=/t, p, ʧ/ from dictionary and word creation task: Percentage of CIs that are identical to the first C of base

Figure 2 shows that 11.11% out of CI and C_1 pairs share the same place and manner (3 out of 27) in the dictionary study. Two items have /tt^h/ /t^{h}t/ (ot^{h}ol-totʰol 'rugged,' ut^{h}ul-tutʰul 'rough'). These are dissimilar in aspiration, and they can be classified into the same type if the vowel harmony is taken into consideration in Korean. One last sequence, /tt/ (etoŋ-teteoŋ 'childlike'), has identical sounds, and it seems to be exceptional to the suggested account. This is the only case that is not consistent with the present analysis. The overall results, however, show that there is an identity avoidance effect between CI and C_1. Furthermore, this identity avoidance effect becomes stronger in the experiment, particularly in terms of place.

For the word creation task, it is 17.58% of CI and C_1 pairs which are identical in place and manner (83 out of 472 tokens). A closer examination of the given data reveals that these 83 cases are classified into 9 types. Out of these 9 types, otok-tʰotok, atal-tʰatal, and uʧʰil-ʧuʧʰil have /tʰt/ or /ʧʧʰ/ which are already different in manner via the laryngeal feature. Four types out of 9 contain /tt/ or /ʧʧ/ (otok-totok, atal-tatal, aʧaŋ-ʧaʧaŋ, and oʧak-ʧoʧak). However, each of the reduplicated forms happens to have a perfect total reduplication counterpart existing in the lexicon:

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removed from the total. With regard to the CI classes, I chose the most frequent ones /t, p, ʧ/ in the dictionary data, not including the other CIs which were few in their occurrences.

(6) a. totok-totok ‘full of knobs’
b. tatal-tatal ‘stammering’
c. ʧaʧaŋ-ʧaʧaŋ ‘hushabye’
d. ʧoʧak-ʧoʧak ‘talking without rhyme; tottering’

This fact suggests that the participants are affected by the existing lexical items, especially when they are analogous in shape and/or meaning.[7] The remaining two types were apam-papam and ʌʧuŋ-ʧʌʧuŋ, both of which have identical CI and C_1. However, these account for only 1.48% in the total of 472 tokens.

The comparison between dictionary and word creation task reveals that the lexical statistic pattern is roughly replicated in the word creation task by native speakers. However, the identity avoidance effect in the word creation task is stronger than in the dictionary.

As for the CI and C_2 from the form VC_1VC_2-CVCVC, I consider /t^h/ and /l/ in otol-t^{h}otol ‘hard and lumpy’ and /ʧ/ and /k/ in omok-ʧomok ‘stout’ in terms of place and manner. What I found is that there is no case in which CI shares the same place and manner as C_2, both in the dictionary and word creation experiment (0 out of 27 and 472, respectively). The percentage of similarity between CI and C_2 significantly diminishes both in place and manner.

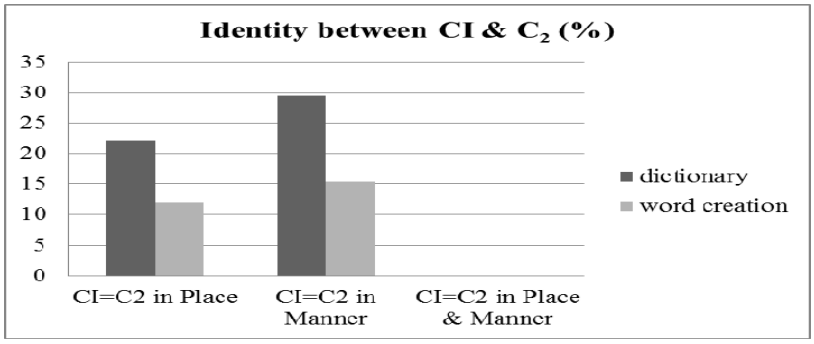

Figure 3. VC_1VC_2-CVCVC, CI=/t, p, ʧ/ from dictionary and word creation task: Percentage of CIs that are identical to the second C of base

[7] Among the other reduplicated forms produced by the participants were six other types which have a corresponding perfect total reduplicated form in the lexicon. However, they come to 9.11% (43 tokens out of 472).

(i)	a.	oloŋ-ʧoloŋ	→	ʧoloŋ-ʧoloŋ	‘in clusters’	14 tokens
	b.	apam-ʧapam	→	ʧapam-ʧapam	‘by driblets’	12 tokens
	c.	otok-potok	→	potok-potok	‘dry and crisp’	6 tokens
	d.	usʌl-tusʌl	→	tusʌl-tusʌl	‘talking in a low voice’	5 tokens
	e.	oloŋ-ʧ^{h}oloŋ	→	ʧ^{h}oloŋ-ʧ^{h}oloŋ	‘twinkling; wakeful’	4 tokens
	f.	otok-p’otok	→	p’otok-p’otok	‘dry and crisp’	2 tokens

In sum, the examination of VCVC-bases both in the dictionary and word creation experiment shows that there is a general tendency toward identity avoidance between the CI and its adjacent consonants in terms of place and manner. The results of the dictionary analysis are not simply replicated in the word creation task, but the effect of identity avoidance is even stronger in the word creation task.

3.2 Speaker variation

Identity avoidance is underway both in the Korean CI-reduplication and Turkish emphatic reduplication. However, there is no clearly preferred CI in Korean whereas there is a clearly preferred CI in Turkish. Rather, there is a set of preferred CIs in Korean. What are those preferred segments? Why is there more than one preferred segment? To address these questions, I ran two experiments of word creation.

The stimuli varied in place (labial, coronal, dorsal), manner (stop, fricative, nasal), order (VC_1VC_2, VC_2VC_1), and vowel (i-i, u-u, a-a). 15 native speakers participated in the two experiments, respectively. They were asked to make the most natural reduplicated form with a CI in the first word creation and to choose the most natural reduplicated form from the CI choices /t, p, ʧ/, which were the most frequent CIs in the lexicon, in the second word creation. Not all subjects who participated in the first experiment participated in the second experiment. There was a three month interval between the two experiments.

For both experiments, there was a clear tendency that the CIs /t, ʧ/ are generally preferred among the subjects.

Table 2. Frequency of CIs from Word Creation 1 (Tokens = 1646)

CI	t	ʧ	k	p	n	s	m	l
Tokens	514	497	252	148	101	90	41	3
Frequency(%)	31.25	30.19	15.31	8.99	6.14	5.47	2.49	0.18

Table 3. Frequency of CIs from Word Creation 2 (Tokens = 1665)

CI	t	ʧ	p
Tokens	641	622	402
Frequency(%)	38.5	37.36	24.14

For a group of participants, /t/ was the most preferred CI. Hence it is called "/t/ Dominant Group." For another group of participants, /ʧ/ was the most preferred CI. Hence it is called "/ʧ/ Dominant Group." For example, in the second experiment subjects S5, S6, S9, S10, S12, and S13 chose /t/

more frequently than /ʧ/.[8] However, subjects S1, S2, S3, S4, S8, S11, and S15 chose /ʧ/ more frequently than /t/.

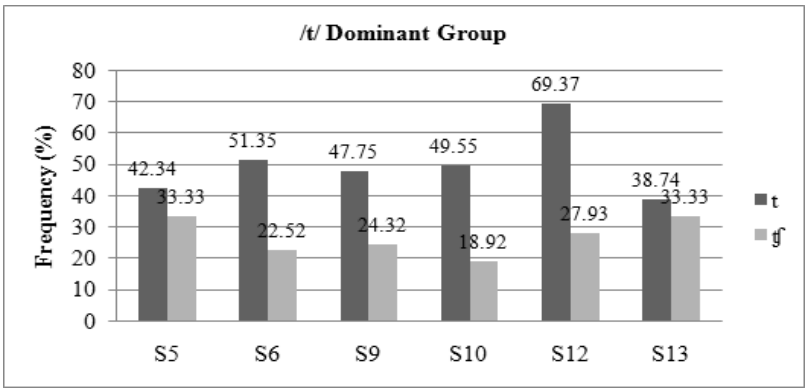

Figure 4. /t/ Dominant Group: Subjects who preferred /t/

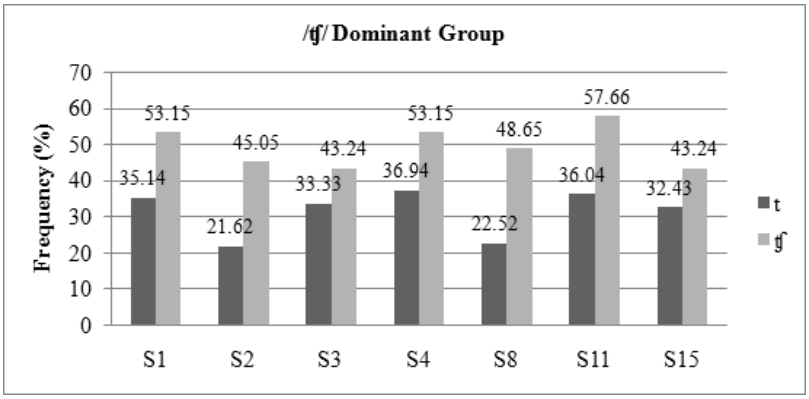

Figure 5. /ʧ/ Dominant Group: Subjects who preferred /ʧ/

Considering the identity avoidance principle carried out in the Korean CI-reduplication, we may understand why we get to have a group which prefers /ʧ/ in this experiment. The stimuli used in the experiment did not have /ʧ/ in the context at all, which makes some subjects go for /ʧ/ for the sake of identity avoidance. On the other hand, we had /t/ as a context consonant in the stimuli but we still got a group of speakers who chose /t/.

[8] For S13, the difference between /t/ and /ʧ/ is only around 5%, which means that it may not be so significant as to put this subject in "/t/ Dominant Group." However, I include this subject too for the reason of simply comparing /t/ and /ʧ/ preferences among the participants.

Does this mean that these subjects did not refer to the identity avoidance principle? Or did they choose some other consonants in the face of /t/ in the context, still abiding by the identity avoidance?

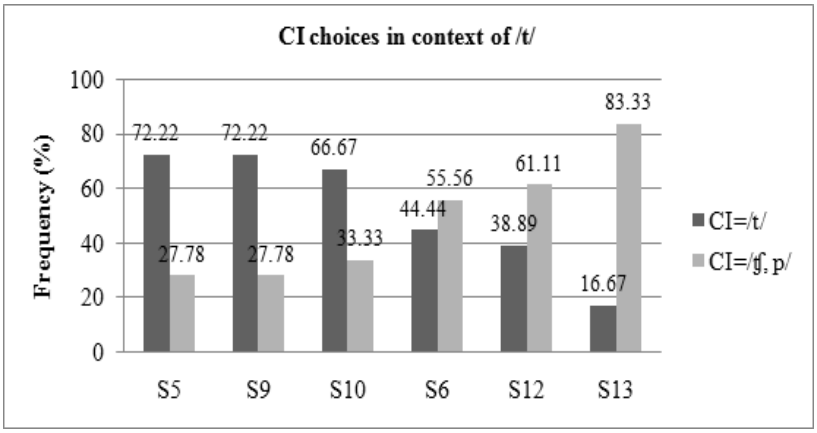

Figure 6. /t/ Dominant Group: CI choices in context of /t/

Figure 6 shows that the /t/ Dominant Group can be broken down into two sub-groups, one still sticking with the preferred CI /t/ and the other rather inserting some other consonants than /t/ in consideration of identity avoidance. Therefore, there is speaker variation with respect to the preferred CIs, and further there is speaker variation even within the same group, e.g. /t/ Dominant Group, regarding whether the identity avoidance is maintained.

To sum up, as for the issue of preferred segments in the Korean CI-reduplication, we see that different speakers may have different preferred segments. Those preferred segments are, among others, /t/ and /ʧ/. Preferred segments are less likely when the context contains those segments, for some speakers. Thus the Korean reduplication presents a good example of interaction between the principle of identity avoidance and speaker variation.

4. Discussion: Implication of the results

Looking through the dictionary and experiment data of reduplication with an inserted consonant, I found that there is no clearly favoured or default consonant inserted in the reduplicant. In line with this finding, I also witnessed that the choice of the inserted consonant depends on the surrounding context. That is, the CI is chosen with reference to the qualities of the existing base consonants such that the CI tends to differ from the neighbouring consonants in terms of the place and manner of

articulation.

These findings suggest the identity avoidance principle: The results from both the dictionary and word creation experiment I examined with regard to the choice of CIs show the identity avoidance effects. This holds with both C_1 and C_2 of the reduplicated form VC_1VC_2-**C**VCVC. As was observed, sonorants like /m, j, n/ are generally less preferred in the onset. However, they were still attested in the word creation task by the native speakers when they meet the condition of identity avoidance. Thus we can see that the identity avoidance effects are strong in choosing a CI in reduplication. On the other hand, I do not exclude a possibility that there might be some other factors that are under operation for the choice of CIs. The identity avoidance does not explain everything because we can still see variation among the subjects in the results of the experiments.

The dictionary and experiment findings from the Korean reduplication are similar to Turkish reduplication data in which the coda consonant of the prefixed CVC syllable tends to differ from the base consonants in terms of segmental resemblance. In both Korean and Turkish reduplication, we see the identity avoidance effects in the sense that the epenthetic consonant in the reduplicant tends to be distinct from the base consonants.

However, there are still some differences: the choice of epenthetic consonants in Turkish reduplication operates at the segmental level, whereas the choice of inserted consonants in Korean reduplication operates at the featural level. The second C in the CVC prefix of Turkish emphatic reduplication is only taken from the fixed set /p, s, m, r/, whereas the inserted C in the Korean total reduplication is not taken from a fixed set of consonants; rather, it is chosen by making reference to the features of the neighbouring consonants. On the other hand, the reduplication phenomena from Korean and Turkish are similar in that the inserted consonant is chosen from a set of consonants in each language, /t, p, ʧ/ in Korean, in the case of the dictionary, and /p, s, m, r/ in Turkish. However, in the reduplication experiment with nonce base forms, it was found that Korean speakers have a wider range of choices in epenthetic consonants, i.e. /t, p, ʧ, k, s, m/, whereas Turkish speakers have a more limited choice in epenthetic consonants, i.e. /p, s, m/. Lastly, there is a clearly preferred CI /p/ in the Turkish emphatic reduplication whereas there is no clearly preferred CIs in the Korean reduplication.[9]

The findings from the Korean reduplication support the idea of identity avoidance principle found in other languages. In addition, the Korean reduplication analysis argues that the speakers' own grammar does not merely reflect the statistics of the lexicon because the pattern discovered in the lexicon, i.e. dictionary in this paper, was not just replicated in the experiment with the native speakers, but it was also reinforced in the

[9] Therefore, as a reviewer pointed out, there appear to be more differences than similarities in the presented reduplication data of Korean and Turkish.

experiment in terms of identity avoidance and the range of possible inserted consonants.

5. Concluding remarks

The identity avoidance principle suggested for the Korean CI-reduplication in this paper is relevant to the notions of the gradient phonotactics and OCP constraint in the extant theories. Providing evidence from many different languages with respect to the tendency to avoid repetition – local and non-local, Frisch et al. (2004) propose a formulation of phonotactic knowledge based on the idea that phonotactic acceptability is a gradient concept which is to be reflected in the pattern of lexical items of a language. In the same vein, Albright (2006) claims that "grammar itself is probabilistic and gradient." (p. 1) Frisch et al. also point out that the traditional OCP constraint, which they call total OCP, is defective because there are some data it cannot explain. Instead, they suggest the gradient OCP, and this gradient or stochastic notion of OCP is consistent with the findings of this paper.

The analysis of the dictionary and experimental results in this paper suggest that the native speakers' knowledge does not simply mirror the phonotactics of the lexicon, but it shows a stronger tendency, e.g. in terms of identity avoidance in the total reduplication. Consequently, the evidence in this paper supports the idea that a constraint like the OCP is not categorical but gradient. Further, the effect is not due to the lexical statistics, but due to a universal preference for identity avoidance.

What is learned from the findings is that the identity avoidance principle is a critical factor in determining the CIs in the Korean and Turkish reduplication. However, identity avoidance is one of several factors that determine the choice of CIs in the case of Korean reduplication. For instance, different speakers may have different default or preferred segments for the CIs in the Korean CI-reduplication. The preferred segments may overrule the identity avoidance principle for some speakers.

The research of this paper is open-ended in that there are more factors that need to be considered in the analysis of the data, e.g. the number and kind of consonants to be inserted, influence of contextual vowels, various combinations of contextual consonants. These are to be considered in further research with a more sophisticated device of measurement.

Appendix A

Dictionary (*Eysseynsu Kwuke Sacen* 2006): Reduplication with VCVC-bases[10]

1. 우물쭈물 umul-**ʧ'**umul
2. 오목조목 omok-**ʧ**omok
3. 우묵주묵 umuk-**ʧ**umuk
4. 어빡자빡 ʌp'ak-**ʧ**ap'ak
5. 우걱지걱 ukʌk-**ʧ**ikʌk
6. 이판사판 ip^{h}an-**s**ap^{h}an
7. 오톨도톨 ot^{h}ol-**t**ot^{h}ol
8. 우툴두툴 ut^{h}ul-**t**ut^{h}ul
9. 어정버정 ʌtʃʌŋ-**p**ʌtʃʌŋ
10. 아장바장 atʃaŋ-**p**atʃaŋ
11. 어런더런 ʌlʌn-**t**ʌlʌn
12. 어룽더룽 ʌluŋ-**t**ʌluŋ
13. 어영부영 ʌjʌŋ-**p**ujʌŋ
14. 아롱다롱 aloŋ-**t**aloŋ
15. 오손도손 oson-**t**oson
16. 오순도순 osun-**t**osun
17. 이몽가몽 imoŋ-**k**amoŋ
18. 애동대동 etoŋ-**t**etoŋ
19. 어근버근 ʌkɨn-**p**ʌkɨn
20. 어금버금 ʌkɨm-**p**ʌkɨm
21. 아근바근 akɨn-**p**akɨn
22. 알록달록 allok-**t**allok
23. 어룩더룩 ʌluk-**t**ʌluk
24. 얼럭덜럭 ʌllʌk-**t**ʌllʌk
25. 얼룩덜룩 ʌlluk-**t**ʌlluk
26. 우락부락 ulak-**p**ulak
27. 아록다록 alok-**t**alok
28. 알락달락 allak-**t**allak
29. 어뜩비뜩 ʌt'ɨk-**p**it'ɨk

[10] There are cases which have alternation in vowels, and I counted them as distinct items for the time being.

Appendix B

Experiment (word creation task)
Directions: Each of the following morphemes is part of a reduplicative form. Based on your intuition as a native speaker of Korean, please fill in each of the blanks with a copied form of the given item. When you create a reduplicant, please make sure that a segment at the outset should be different from the correspondent in the given morpheme. Also make sure to read new forms aloud when you are creating them.

Stimuli with a VCVC base[11]

1. 우술 usul
2. 오독 otok
3. 오작 oʧak
4. 아식 asik
5. 아달 atal
6. 우칠 uʧʰil
7. 어중 ʌʧuŋ
8. 오삼 osam
9. 우끈 uk'ɨn
10. 아장 aʧaŋ
11. 우설 usʌl
12. 오공 okoŋ
13. 아밤 apam
14. 오감 okam
15. 오롱 oloŋ

[11] The stimuli were given in Korean to the participants. The stimuli were newly made up for the sake of the experiment, except for a few which happen to be identical to those in a dialect that are not known well.

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