

Semantic Features as a Cause of Tensification in Korean Sub-compounds

Han-gyoo Khym

Dept. of General Studies, Daejin University, Korea(R.O.K.)
khymhg@dreamwiz.com

Abstract

Nominal compounds of 'N1 + N2' in Korean can be classified into the following three major categories: co-compound, sub-compound, and fusion. Among these three major categories, insertion of /t/ in the compounding process and subsequent tensification are found only in sub-compounds. This peculiar phenomenon of /t/-insertion which causes, in turn, tensification in sub-compounds has been long controversial because linguists have not been able to expect in which phonological environment of sub-compounding insertion of /t/ takes place. In this paper, I explore a phonological rule which makes it possible to expect the phonological environments of sub-compounding that allow insertion of /t/ and automatic tensification of the subsequent consonant in the onset of N2. In this process, I show that semantic feature(s) between two combined roots should be considered as one of the important structural descriptions in phonology.

Keywords: *tensification, sub-compounds, phonological environments, semantic relations (features), /t/-insertion*

1. Introduction

The phonological phenomenon of tensification in Korean compound words has long been one of the most confusing topics to explain by rules. Many attempts such as Kim (1975), Jung (1980), and Ahn (1985) among others, have been done to explain the phenomenon through purely phonological perspectives, with no satisfactory results. Hyman (1978)'s idea based on the concept of 'boundary change' does not provide why tensification takes place only for some cases of sub-compounds in Korean. Unlike previous studies, My research begins with the idea that probably the difficulty in explaining the tensification phenomenon of Korean compounds may be due to some more complicate internal features hidden and working in the process of tensification, and the features may not purely phonological. In realizing this idea, one very critical issue is if there are some non-phonological features involved in this process, then is it admissible for us to capture them into the field of phonology.

This issue of abstractness in the so-called science of phonology maybe justified by the many theories in phonology employing the abstract levels just before coming into the surface forms of representation in

phonology, too. According to pilot studies on this topic, some semantic features – or semantic relations – between N1 and N2, which combine to form a compound, seem to be working very positively than other semantic ones, and in this paper I am trying to find them out to explain the tensification phenomenon in the sub-compounds in Korean in the form of semantics unified in phonology.

2. Discussion I

When there is a nominal compound of the structure ‘N(oun)1 + N(oun)2’ and the coda of N1 is filled with a voiced segment, voicing of the following obstruent of N2 is quite generally expected instead of tensing. Interestingly enough, however, there are some Korean nominal compound words in which tensification of the obstruent in the onset of N2 is observed as often as voicing. The following are the data I will discuss here. (1) and (2) have examples of co-compound and fusion respectively. These two examples are added for comparison with those examples of sub-compound of (3) below. In (3), ‘ ’ ’ is used for tensified consonants not for ejectives.

(1) Co-compound

- | | |
|---|---|
| <p>a. maso
ma # so
horse cow
‘horse and cow’</p> | <p>b. pəmkail
pəm # kail
spring fall
‘spring and fall’</p> |
| <p>c. atʃimɔʒənyək
atʃim # ɔʒənyək
morning evening
‘morning and evening’</p> | <p>d. santil
san # til
mountain field
‘mountain and field’</p> |

(2) Fusion

- | | |
|---|--|
| <p>a. səwəl
sɛ # wəl
year month
‘time’</p> | <p>b. kaŋsan
kaŋ # san
river mountain
‘country’</p> |
|---|--|

(3) Subcompound

- | | |
|--|---|
| <p>a. Instrumentive/Source
① ssalsul
ss⁴al # sul
rice wine
‘rice-wine’</p> | <p>② kəŋpap
kəŋ # pap
bean (boiled) rice
‘bean-mixed rice’</p> |
| <p>③ ɔʒaŋɔʒərim
ɔʒaŋ # ɔʒərim
soy meat boiled down (in sauce)
‘meat boiled down in sauce’</p> | <p>④ pulkəkɪ
pul # kəkɪ
fire meat
‘grilled meat’</p> |

b. Agentive/Patientive

① **hæ tɔdʒi**

hæ # tɔdʒi ##
sun rising
'sunrise'

② **mulpadʒi**

mul # padʒi ##
water reception
'gutter'

c. Genitive

① **sənt'iŋ**

sən # t iŋ ##
hand back
'back of the hand'

② **dʒəŋs'əri**

dʒəŋ # səri ##
bell sound
'sound of a bell'

③ **mul'səri**

mul # səri ##
water sound
'sound of (flowing) water'

④ **nunt'əŋdʒa**

nun # təŋdʒa ##
eye pupil
'pupil of the eye'

d. Locative (Time)

① **pəm'pi**

pəm # pi ##
spring rain
'spring rain'

② **mulk'əki**

mul # kəki ##
water fish
'fish'

③ **pamk'əri**

pam # kəri ##
night street
'night streets'

④ **kaŋs'aram**

kaŋ # saram ##
river man
'a man living at a river'

⑤ **kaŋp'aram**

kaŋ # param ##
river wind
'a breeze from the river'

⑥ **kyəulp'aram**

kyəul # param ##
winter wind
'winter wind'

e. Beneficiary⁵

① **kəki'pæ**

kəki # pæ ##
fish boat
'fishing boat'

② **dʒamdʒ'ari**

dʒam # dʒari ##
sleep space
'bed'

As we see from the data of co-compound and fusion in (1) and (2) respectively, they do not show tensification in surface forms; while the data under (3.c) to (3.e) show tensification in sub-compounding.

Comparison of the phonological environments of the data in terms of [\pm tensification] is shown in the following:

(4) P.E.	Realization	-Tensification	+Tensification
-m # k-	→ -mk- / -mk'-	1.b: pəm <u>mk</u> ail	3.d.③: pəm <u>mk</u> 'əri
-m # c-	→ -mdʒ- / -mdʒ'-	1.c: aʃ <u>imdʒ</u> əniək	3.e.②: ca <u>mdʒ</u> 'ari
-n # t-	→ -nt- / -nt'-	1.d: sa <u>nt</u> il	3.c.①: sə <u>nt</u> 'iŋ
-ŋ # s-	→ -ŋs- / -ŋs'-	2.b: ka <u>ŋs</u> an	3.c.②: dʒə <u>ŋs</u> 'əri
-l # s-	→ -ls- / -ls'-	3.a.1: ss <u>als</u> ul	3.c.③: mu <u>ls</u> 'əri
-ŋ # p-	→ -ŋp- / -ŋp'-	3.a.2: kə <u>ŋp</u> ap	3.d.⑤: ka <u>ŋp</u> 'aram
-l # k-	→ -lk- / -lk'-	3.a.4: pu <u>lk</u> əkʰi	3.d.②: mu <u>lk</u> 'əkʰi
-l # p-	→ -lp- / -lp'-	3.b.2: mu <u>lp</u> adʒi	3.d.⑥: kyəu <u>lp</u> 'aram

As we see from the description of (4), it is very hard in which phonological environment tensification takes place. The same phonological environment causes tensification in some data of [+Tensification] by crossing over the word boundary #, but not in others of [-Tensification].

Among others, Kim (1975), applying the idea of 'boundary', suggested the following rule to explain this phenomenon.

$$(5) \quad \phi \rightarrow t / [+son] \text{ ______ } C \begin{bmatrix} +cons \\ -tens \end{bmatrix} \quad (C = \text{compound boundary})$$

However, his data were quite limited and we can easily find data that are not explainable by his rule of (5). For example, in the following data, tensification does not occur though the phonological environments meet with the condition of (5): (1a) ma # so → maso, *horse and cow*, (1b) pəm # kail → pəmkaɪl, *spring and autumn*, (2b) kaŋ # san → kaŋsan *country*, (3.a.1) ssal # sul → ssalsul *ricewine*, etc.

Jung (1980) tries to explain the same phenomenon by way of following two rules:

$$(6) \quad a. \quad C \rightarrow [+tens] / \begin{array}{|c|} \hline \text{C} \\ \hline \begin{array}{|c|} \hline [+son] \\ \hline \end{array} \\ \hline \end{array} \begin{array}{|c|} \hline \text{N} <V^{**}> \\ \hline \end{array} \begin{array}{|c|} \hline \text{SM} \\ \hline \end{array}$$

$$b. \quad \phi \rightarrow t / \begin{array}{|c|} \hline V^* \text{ ______ } \\ \hline \end{array} \begin{array}{|c|} \hline [C \\ \hline \end{array} \begin{array}{|c|} \hline N \\ \hline \end{array} \begin{array}{|c|} \hline N \\ \hline \end{array}$$

(SM = Sentence Marker, V** = verb, V* = Vowel)

Jung covers broader and more data than those in this paper: it goes beyond nominal compound of N1 + N2 which is the main focus of this paper. Jung explains tensification in sub-compound ranging from 3.c to 3.e such as 'sənt'iŋ' *back of the hand* (3.c.①), 'mulk'əkʰi *fish* (3.d.②), 'dʒamdʒ'ari *bed* (3.e.②), and more data such as 'pəmp'aram *spring wind*, 'suldʒ'ip *a bar*, 'təndʒ'uməni *a (coin) purse*, etc. (Of course, the new data introduced by Jung can be explained by my theory which will be developed and depicted soon.) However, what about the data from (1) to (3b) which do not show any tensification? Neither is possible by (4) of Jung (1980), nor are the following counter data, which have the same phonological environments as Jung's (1980) data⁹. Consider:

- | | | | | |
|-----|----------------|----------------|---------------------------|----------------------|
| (7) | Data from Jung | vs. | Counter Data against Jung | |
| | a. pɔmp'aram | spring wind | a'. kimpinyə | a gold(en) hairpin |
| | b. sulɟ'ip | a bar | b'. tɔɟip | a stone house |
| | c. tɔndɟ'uməni | a (coin) purse | c'. pitandɟuməni | a purse made of silk |

The existence of data such as those from (1) to (3.b) plus the counter data shown in (5) is strong evidence of the insufficiency in explanatory power of Jung's set of rules.

Another approach to this topic by Ahn (1985) is different from Kim and Jung in that Ahn is based on morphological explanation rather than phonological one. Trying to unify two separate rules offered by Jung which are shown above as (6), he suggests a morphological level on which /t/-insertion occurs.

- (8) /t/-epenthesis
- $$\phi \rightarrow t / [+son] \text{ ____ } \\ <[+lat]> \text{ ____ } N \text{ ____ } N [C \\ * <D> \quad \text{(domain: S1)}$$

Ahn assumes four levels in the morphological component: S1 for sub-compounding, S2 for co-compounding, S3 for derivation, and S4 for inflection and case-marking. He further assumes that /t/-insertion takes place only on the first level, that is, S1.

By limiting the level of /t/-insertion to S1, which is assumed for sub-compounding, Ahn explains tensification of (7a,b&c) such as pɔmp'aram *spring wind*, sulc'ip *a bar* and tɔndɟ'uməni *a (coin) purse* as well as non-tensification of co-compounding such as (1.a) maso *horse and cow*' and (1.b) pɔmkail *spring and fall*, etc. Ahn, however, cannot deal with the counter examples against Jung which are shown as (9) in the following (The following is a repeat of part of (7)). Consider:

- (9) Counter Data against Jung(1980)
- | | | | | | | | | |
|----|----|-------|---|--------|----|---|--------------|----------------------|
| a' | ## | kim | # | pinyə | ## | → | kimpinyə | a gold(en) hairpin |
| b' | ## | tɔl | # | ɟip | ## | → | tɔlɟip | a stone house |
| c' | ## | pitan | # | ɟuməni | ## | → | pitandɟuməni | a purse made of silk |

The data shown in (9) belong to sub-compound words, so they are supposed to be subject to Ahn's rule of (8). Again, however, it cannot explain why the data (9) do not show the expected process, nor can we include the data (9.a',b',& c') in the co-compound category.

The discussion so far leads us to conclude that as far as purely phonological approach is concerned, we cannot explain /t/-insertion and subsequent tensification phenomena which occur irregularly inside compound words because the same phonological environment(s) cause different phonological results.

3. Discussion II

Before we get into the answer to the question at hand, we need to discuss Hyman's (1978: 443-447) suggestion concerning 'boundary change' first. He suggests two grammatical boundaries within a word: one is '#' which is for internal word boundary and the other is '+' which is for morpheme boundary. Phonological

rules are supposed not to be able to apply crossing over the internal word boundary ‘#’ and they can’t influence a segment belonging to another word. Whereas, they can cross the ‘+’ boundary. This means that phonological sound change crossing over a word boundary which is depicted here as consonant tensification in the onset of the following root, should be preceded by the application of some rule or condition which allows crossing-over or weakening of # boundary. This idea as well as the relative strength of each boundary in morphology is expressed in the following:

(10) Boundary Change (Hyman 1978)

$$\| \rightarrow \#\# \rightarrow \# \rightarrow + \emptyset$$

Secondly, it is necessary to assume that semantic features such as Agentive, Patientive, Genitive, Locative (Time), etc., which are used to distinguish among sub-compound words, must be considered as part of the structural descriptions.

With these two conditions in mind, we can expect that the internal structure of the sub-compound words which show /t/-insertion and subsequent tensification should be [# ____ + ____ #] after boundary change in (10). Therefore, sub-compound words with the internal structure [## N1 # **SR*** # N2 ##] will experience weakening of internal word boundary ‘#’ to ‘+’ only when SR* (Semantic Relations) is one of those such as Genitive, Locative(Time), and Beneficiary. Recall that data only from (3c,d,&e) of sub-compounds are showing tensification, and the Semantic Relations - or Semantic Features - of N1 and N2 of these data are Genitive, Locative(Time), and Beneficiary..

After weakening of the internal word boundary, /t/-insertion and subsequent tensification of the first segment on the onset of of N2 will follow. The process of boundary weakening may be described as (11):

(11) Boundary Weakening Condition

$$\begin{array}{ccccccc} \# & \rightarrow & + & / & C & \neg & \Gamma \\ & & & & [+son] & \neg & N1 _ _ SR^* _ _ N2 _ _ L \\ & & & & & & [Gen] \\ & & & & & & [Loc] \\ & & & & & & [Ben] \end{array}$$

(SR* =Semantic Relation)

Concerning the inserted sound, there have been many explanations. However, based on the following data, I will follow the explanation of /t/-insertion which was suggested by Kim-Renaud (1975), Yoo (1964), and Heo (1984) among others. Consider:

- (12) a. / ʃɔ # pul / → [ʃɔt>p’ul] ~ [ʃɔp’ul] <GENITIVE>
 candle light
 ‘candlelight’
- b. / khɔ # tɪŋ / → [khɔt>t’iŋ] ~ [khɔ t’ iŋ] <GENITIVE>
 nose ridge

‘the ridge of the nose’

c.(=3.e.①) / kɔki # pæ / → [kokit>p’æ] ~ [kokip’æ] <BENEFICIARY>
 fish boat
 ‘fishing boat’

d. / næ # ka / → [næ<t>k’a] ~ [næk’a] <LOCATIVE>
 river side
 ‘rive-rside’

All the data in (12) belong to sub-compounds with semantic relations of Genitive (12a&b), Locative (12d) and Beneficiary (12c). For each of the data of (12) which have N1 as an open syllable, we have two realizations: one with /t/-insertion and the other without /t/-insertion, but both with tensification. The data in (12) and those from (3c) to (3e) show two important similarities: (1) all of them belong to the category of sub-compounds. (2) All of them belong to the semantic relations of {Genitive, Locative (Time) and Beneficiary}. In addition to these similarities, the observation that there could be two realizations of each sub-compound word in (12) and one of two realizations has unreleased [t>] in the coda of N1, leads us to the assumption that probably all the sub-compound data showing the same tensification phenomenon may experience /t/-insertion after boundary weakening which is caused by the intervening proper semantic relations. The rule for /t/-insertion we can obtain from the observation above should be as follows:

(13) /t/-Insertion Rule

∅ → t /] N1 + SR* + N2 [...

where SR* indicates Semantic Relations (or features) like Gen, Loc(Time), and Benef.

Based on the two important rules we have developed so far and some other rules which have already explored for the explanation of Korean data, let’s see how the data in (3c - e) and (12) could be explained. (14) is a repeat of some data of (3c-e) and (12) all of which are showing tensification, while (13) is a repeat of some data without tensification. Consider:

(14) Data with Tensification

a. (=12a) / ʃɔ # GEN # pul / ‘candlelight’
 candle light
 ʃɔ + pul (11) Boundary Weakening Condition
 ʃɔ t pul (13) /t/- Insertion
 ʃɔ t’ pul Obstruent Unreleasing (or Neutralization)
 ʃɔ t> p’ul Tensification after Obstruent Unreleasing
 ʃɔ p’ul (Consonant Cluster Simplification RuleCCSR)
 [ʃɔt>p’ul] ~ [ʃɔ p’ul] Output

b. (=3c.①) / sɔn # GEN # tiŋ / ‘the back of the hand’
 hand back
 sɔn + tiŋ (11) Boundary Weakening Condition

sɔn t tɪŋ	(13) /t/-Insertion
sɔn t> tɪŋ	Obstruent Unreleasing (henceforth OU)
sɔn t> t'ɪŋ	Tensification after OU
sɔn t'ɪŋ	CCSR
[sɔnt'ɪŋ]	Output

c. (=3d.①) / pɔm # TIME # pi /	'spring rain'
spring rain	
pɔm + pi	(11) Boundary Weakening Condition
pɔm t pi	(13) /t/-Insertion
pɔm t> pi	OU
pɔm t> p'i	Tensification after OU
pɔm p'i	CCSR
[pɔmp'i]	Output

d. (=3d.②) / mul # LOC. # kɔki /	'fish'
water fish	
mul + kɔki	(11) Boundary Weakening Condition
mul t kɔki	(13) /t/-Insertion
mul t> kɔki	OU
mul t> k'ɔki	Tensification after OU
mul k'ɔki	CCSR
[mul k'ɔki]	Output

e. (=3e.①) / kɔki # Ben. # pæ /	'fishing boat'
fish boat	
kɔki + pæ	(11) Boundary Weakening Condition
kɔki t pæ	(13) /t/-Insertion
kɔki t> pæ	OU
kɔki t> p'æ	Tensification after OU
kɔki t> p'æ	(CCSR)
[kɔkit> p'æ] [kɔkip'æ]	Output

(15) Data without Tensification

a. (=7b'=9b') / tɔl # SOURCE # dʒip /	'a stone house'
stone house	
not appl.	(11) Boundary Weakening Condition
not appl.	(13) /t/-Insertion
not appl.	OU
not appl.	Tensification after OU
not appl.	CCSR
[tɔldʒip]	Output

b. (=7c')	/pitan	# SR*	# dʒuməni /	'a purse made of silk (a silk purse)' (cf.: SR*: Semantic Relations)
	silk		purse	
		not appl.		(11) Boundary Weakening Condition
		not appl.		(13) /t/-Insertion
		not appl.		OU
		not appl.		Tensification after OU
		not appl.		CCSR
			[pitandʒuməni]	Output
c. (=3a.④)	/pul	# INSTRU.	# kəki /	'grilled meat'
	fire		meat	
		not appl.		(11) Boundary Weakening Condition
		not appl.		(13) /t/-Insertion
		not appl.		OU
		not appl.		Tensification after OU
		not appl.		CCSR
			[pulkəki]	Output

4. Conclusion

As (14) and (15) show, all the data which have been left unexplained by previous approaches done by Kim, Jung, and Ahn, among others, are correctly explained by the framework I have developed in this paper. This framework proposed with the help of semantic features working in the phonological computation is largely based on the two critical rules such as 'Boundary Weakening Condition(BWC)' which is assumed to be caused by the semantic relations (or features) and '/t/-insertion Rule' which directly follows BWC.

In order to maintain the critical condition of 'Boundary Weakening', we have to assume that semantic relations (or features) between two nominal roots of N1 and N2 in a sub-compound word should be visible in phonological process, which means that they have to be admitted as part of structural description in phonology. Further discussion on the possibility of admitting some more detailed semantic relations (features) into phonology will be required.

References

- [1] Ahn, S.-C., The Interplay of Phonology and Morphology in Korean, Univ. of Illinois at Urbana Champaign, Ph.D. dissertation, Hanshin Publishing Co. Seoul, Korea, 1985.
- [2] Allen, M., Morphological Investigations, Univ. of Connecticut, Ph.D. dissertation, 1978.
- [3] Heo, W., Korean Phonology, Cheongum Publishing Co. Seoul, Korea, 1984.
- [4] Hyman, L. M., An Introduction to Natural Generative Phonology. Academic Press, New York, 1975.
- [5] Jung, K., Neutralization in Korean: A Functional View, Univ. of Texas, Ph.D. dissertation, Hanshin Publishing Co. Seoul, Korea, 1980.
- [6] Khym, H., "Constraints on Noun Incorporation in Korean", Kansas Working Papers in Linguistics, 22:41-55, 1997b.
- [7] Kim-Renaud, Y., Korean Consonantal Phonology, Tower Press, Seoul, 1975.
- [8] Kim, S., "On the Theories of Rule-Ordering in Korean", Study of Linguistics, Vol. 5. Seoul National Univ. Press. Seoul, Korea, 1990.

- [9] Kim, Y., Korean Consonantal Phonology, Ph.D. dissertation, Univ. of Hawaii, 1975.
- [10] Kenstowicz, M., Phonology in Generative Grammar, Blackwell Publishers, Cambridge, Mass, 1994.
- [11] Shi, J., Word Formation Principles in Korean, Korea Univ. Ph.D. dissertation, Seoul, Korea, 1993.
- [12] Yoo, C., "A Study of /t/-Insertion in Korean", *Tongpanghak-je*, Vol. 7, pp.19-37, Yonsei Univ. Press, Seoul, Korea, 1964.