Tensification of Obstruents in Korean

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1. Following Chomsky and Halle,[1] Kim[2] multiplies the role of compound boundary too much by assuming that t-insertion rule, which is applied to compound boundary, provides input for tensification.

This paper will argue that tensification is not motivated by t-epenthesis, which will eventually be a criticism against Kim's abstract solution on bounbary phenomea.

2. In Korean every consonant is neutralized at the end.

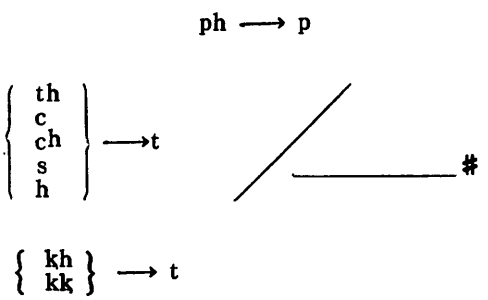
(I)	orthography	pronunciation	English translation
1.	iph	[ip]	leaf
2.	nath	[nat]	piece
	nac	[nat]	daytime
	nach	[nat]	face
	nas	[nat]	sickle
	nah-	[nat]	bear (root)
3.	puəkh	[puək]	kitchen
	pakk	[pak]	outside

From (I) we may pose independently motivated neutralization rule.

1) Noam Chomsky and Morris Halle, ***The Sound Pattern of English*** (New York : Harper & Row, 1968), p.366.

2) C. W. Kim, "Boundry Phenomena in Korean"; ***Papers in Linguistics***, 1 (1969), pp.1-24.

Ruln (1) : Consonant Neutralization



Kim tries to incorporate his epenthesis rule shown below with tensification of obstruents by what he calls 'compound boundary' denoted by++, because he assumes that t-epenthesis in Korean phonology is motivated primarily as a tactical device to tensify the following oral obstruents, in other words, to provide an input for tensification.

Kim's t-epenthesis rule : $\phi \longrightarrow t \;/\; \left\{ \begin{matrix} V \\ C \end{matrix} \right\} + \_\_\_\_\_ + C$

The rule above inserts t in his compound boundary if the initial segment of the second element of the compound is a consonant. Then tensification follows.

(Ⅱ)	1. a.	kamca	[kamja]	potato
	b.	kam+ca	[kamc'a]	let's coil
	2. a.	camcali	[camjari]	dragonfly
	b.	cam+cali	[camc'ari]	sleeping place
	3. a.	n-+ka	[næga]	I (+subject particle)
	b.	næ+ka	[nækk'a]	streamside
			[næk'a]	

As shown in the examples in (Ⅱ), the t-epenthesis rule seems to be closely related

with the behavior of boundary. But we may assume from the examples in (Ⅲ) below that the role of boundary is not the necessary and sufficient condition for tensification.

(Ⅲ) 1.	wum+toti	[umdoji]	sprout
	mom+cosim	[momjosim]	taking care of oneself
	pom+kali	[pomgari]	spring plowing
	caŋ+colim	[caŋjorim]	meat boiled in soy sauce
2.	khoŋ+pap	[khoŋbap]	bean-mixed rice
	koŋ+pap	[koŋp'ap]	free meal

Kim's t-epenthesis rule functioning as an input for tensification makes grammar complex because this is quite an abstract solution of the problem. Let's see some examples.

(Ⅳ) aph+kil	[apk'il]	future
nac+cam	[natc'am]	nap
nat+kali	[natk'ari]	stack
mith+cul	[mitc'ul]	underline
such+pul	[stup'ul]	charcoal fire

In order to derive the surface forms in (Ⅳ), e.g., [apk'il] and [natk'ari] from aph+kil and nat+kali, respectively (where to aph+kil consonant neutralization is applied first, and nat+kali undergoes l ⟶ r/ V___V), he has to use three more rules, i. e., t-epenthesis and tensification followed by three consonant cluster simplification rule.[3] If, on the other hand, we do not assume that t-epenthesis provides input for tensification, [apk'il] is derived directly from tensification followed by neutralization.

3) When a two-consonant cluster-final morpheme is followed by a vowel it is resyllabified and preserved (C) VCC-V(C) to (C)CV=CV(C), but the consonant cluster followed by a consonant, one of the consonants, usually the middle consonant, deletes.

(V) 1.	nalu+pæ	a.	[narutp'æ]	ferryboat
		b.	[narup'æ]	
2.	pæ+kil	a.	[pætk'il]	waterway
		b.	[pæk'il]	
3.	cho+pul	a.	[chotp'ul]	candlelight
		b.	[chop'ul]	
4.	mæ+tol	a.	[mætt'ol]	millstone
		b.	[mæt'ol]	
5.	hæ+sal	a.	[hæts'al]	sunbeam
		b.	[hæs'all]	

In the example (V) Kim can explain (a) forms but he can not explain (b) forms, where tensification occurs in spite of the fact that his structural description is not satisfied. This may also imply the possibility that tensing rule is not entirely motivated by t-epenthesis.

There are other cases, however, where Kim's rule does not meet the structural description, but tensification occurs. The voiceless obstruents become tense without exception in the conjugation of some verbs whose roots end in -m or -n, and also in other complex combinations, where the end of the roots and the beginning of suffixes end in obstruents, as shown below.

(VI) 1.	kam-ta	[kam'a]	indicative (wash hair or coil)
	-ko	[k'o]	gerundive (and)
	-ca	[c'a]	propositive (let's)
	-so	[s'o]	indicative (plain speech)
	-ci	[c'i]	persuative (why not)
2.	sin-ta	[sint'a]	indicative (put on shoes)
	-ko	[k'o]	gerundive
	-ca	[c'a]	propositive
	-so	[s'o]	indicative (plain speech)
	-ci	[c'i]	persuative

(Ⅷ)	ip-ta	[ipt'a]	put on clothes (indicative)
	mək-ci	[məkc'i]	won't you eat (persuative)
	kop-so	[kops'o]	be beautiful (indicative)
	pəs-ki	[pətk'i]	taking off (nominative)
	anc-ta	[antt'a]	sit (indicative)

In case of (Ⅵ) and (Ⅶ) where the complex combinations are linked by a bound morpheme or dependent morpheme marker instead of a compound boundary, Kim's t-epenthesis rule may not apply.

3. So far we have seen that Kim's t-epenthesis does not capture tensification occuring in verious environments, and that it may not provide an input for tensification.

In Korean there is an independently motivated tensing rule, where oral obstruents become tensified after stops regardless of boundary as shown below.

$$\text{Rule (2)}: \quad \begin{Bmatrix} C \\ -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{tense}] \; / \; \begin{Bmatrix} C \\ -\text{cont} \\ -\text{nas} \\ -\text{asp} \end{Bmatrix} \text{———}$$

Rule (2) will əxplain exaıple in (Ⅳ) and (Ⅶ), but forms in (Ⅴ) seem not to be derived by Rule (2) alone. Rule (2) may apply after t-epnthesis to derive (Ⅴ a) forms, but it does not seem to be in right track, setting aside the fact that (Ⅴ b) forms still remain unexplained.

We may pose a morphological rule which tensifies the first obstruents of the second noun in a compound noun combined with two nouns. We may call this compound noun tensification rule which is formulated as below.

Rule (3):

$$\begin{Bmatrix} -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{tense}]$$

Condition: Applied in a compound noun if the obstruents occur in the first position of the second noun.

Rule (3) will explain (Vb) forms correctly, and (Va) forms will be captured by an optional t-epenthesis rule below.

Rule (4): $\phi \longrightarrow$ t / V+ ___ +C

Rule (3) will also explain (Ⅱ 2) and (Ⅱ 3). camcali of (2a) and næ-ka of (3a) are not compound nouns, but cam+cali of (2b) and næ+ka of (3b) are compound nouns.

Examples in (Ⅲ), however, are troublesom. Forms in (Ⅲ 1) are compcund nouns but tensification does not occur. The second noun tot-i, cosim, kal-i, and coli-m are nominalized forms from the verbs tot-ta [tott'a] 'rise,' cosim-ha-ta [cosimhada] 'take care of,' kal-ta [kalda] 'plow,' and coli-ta [corida] 'boil,' respectively. So -i in toti and kali, and -(i)m in cosim are dependent morphemes denoting a kind of nominalized forms of verbs.

In case of cosim we may pose a zero morpheme. It always combine with ha-ta 'do,' a special verb, to make cosim a verb. So cosim itself may be regarded as a nominalized form of cosimhata.

From the facts above, we may have sufficient motivation to pose a constraint on Rule (3), i.e., if one of the element of compoud nouns has a dependent morpheme which nominalizes a verb, Rule (3) is blocked. In this case intervocalic voicing rule below will be applied, i.e., obstruents become voiced intervocalically.

Rule (5):

$$\begin{Bmatrix} -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{voice}] \quad / \text{ V } \_\_\_ \text{ V}$$

So Rule (5) and reformulated form of Rule (3) below will be involved in the explantion of (Ⅲ 1) forms.

Rule (3) (reformulation):

$$\begin{Bmatrix} -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{tense}]$$

Condition: 1. Applied in a compound noun if the obstruents occur in the first position of the second noun.

2. Is blocked if one of the nouns has a dependent morpheme.

Problems in (Ⅵ) still remain unsolved. We may pose another tensing rule which tensifies obstruents of dependent morphems occuring after the root of a verb which ends in m or n.

Rule (6):

$$\begin{Bmatrix} -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{tense}]$$

Condition: When the obstruent is the first consonant of dependent morphemes occuring after the root of a verb ending with m or n.

Rule (6) will explain (Ⅵ).

Here, we may also pose Rule (6) as a condition on Rule (3). So, the final re-reformulated rule of Rule (3) will be as follows:

Rule (3) (final reformulation): Compound noun tensification rule.

$$\begin{Bmatrix} -\text{voc} \\ +\text{cons} \\ -\text{nas} \end{Bmatrix} \longrightarrow [+\text{tense}]$$

Condition: 1. Appliec either (a) in a compound noun if the obstruents occur in the first position of the second noun, or

(b) when the obstruent is the first consonant of dependent morphemes occuring after the root of a verb ending with m or n.

2. Is blocked if one of the nouns has a dpendent morpheme.

Another problem still unsolved is khoŋ+pap and koŋ+pap of (Ⅲ 2), along with il=to [ilt'o] 'one degree' and il=pun [ilbun] 'one minute,' all of which Kim also leaves unexplained.

koŋ+pap [koŋ p'ap] 'free meal' may be explained by Rule (3) because it is not a compound noun. Rule (3), however, does not capture tensification, and khoŋ+pap [khoŋ bap] 'bean-mixed rice' still remains as an exception to Rule (3). To the researcher khoŋ+pap and koŋ+pap seem to be related with some psychological condition of the speaker. When we speak koŋ+pap, some kind of pleasure or excitement is always implied. So in order to emphasize the feeling, tensification seems to be followed. Voicing in khoŋ+pap may occur to distinguish it from koŋ+pap.

4. We have seen that Kim's t-epenthesis rule does not provide an input for tensification, i. e., Kim does not capture tensification occuring various environments correctly. The arguments so far may be summarized as follows:

1) Kim's attempt to capture tensification by the role of bounbary makes grammar complex as a sample derivation shows.[4]

A sample derivation (Kim's solution):

	/aph++kil/	/nalu++pæ/	/k'och++niph/
1. Con. Neut. :	ap++kil	-------	k'ot++nip
2. t-epen. :	ap+t+kil	nalu+t+pæ	k'ot+t+nip

4) In the sample derivation, ***aph++kil*** and ***nalu++pæ*** represent (Ⅳ) and (Ⅴa) forms, respectively, anp ***k'och++niph*** represent Kim's (5 iii a) forms, which is not related with tensification but can show another weakness of t-epenthesis rule. In derivation only relevant rules were discussed.

3. tensifi. :	ap+t+k'il	nalu+t+p'æ	--------
4. 3c simpl. :	ap+ +k'il	--------	k'ot+ +nip
5. nasal assim. :	-------	--------	k'on+ +nip

surface form : [apk'il] [narutp'æ] [k'onnip]

(Alternative solution)

	/aph+kil/	/nalu+pæ/	/k'och+niph/
1. con. neut. :	ap+kil	-------	k'ot+nip
2. tensifi. :	ap+k'il	nalup'æ	-------
3. t-epen. (optional) :	------	nalutp'æ	-------
4. nasal assim. :	------	-------	k'on+nip
surface form :	[apk'il]	[narutp'æ] [narup'æ]	[k'onnip]

The alternative solution does not meed not only the ordering restriction between t-epenthesis and tensification, but also t-epenthesis and three consonant cluster simplificationrules. One phonological rule of Rule (2) will be involved in [apk'il]. The alternativesolution also captures the alternate forms [narutp'æ]~[narup'æ] by condition (la) of Rule (3) and Rule (4), optonal t-epenthesis rule, while Kim's solution can only derive [narutp'æ].

2) The alternative solution will also explain (Ⅲ 1) forms by the condition (1b) of Rule (3) and rule (5). Kim's t-epenthesis, on the other hand, will derive ill-forms as shown below.

Sample Derivation :

	Kim's solution	Alternative solution
	/pom++kali/	/pom+kali/
1. t-epenthesis :	pom+t+kali	--------
2. tensification :	pom+t+k'ali	--------

3. 3c simplification :	pom+ +k'ali	-------
4. voicing rule :	--------	pomgali
surface form :	* [pomk'ali]	[pomgari]

3) The alternative solution will explain in (Ⅵ) and (Ⅶ) by the condition (1b) of Rule (3) and Rule (2), respectively. But Kim's t-epenthesis rule is blocked. The structural description is not satified.

The importance of the alternative solution may not end with the factual differences of the results between the two as we have seen above. The more important thing seems to lie in its theoretical implications.

Historically an epenthetic letter was used to denote pause without sound as a tactical device to tensify the following lenis obstruents. These pauses without sound, by the documents of the 15th-century korean, were designated by six different letters, i. e., p, w, ?, k, t, and s, among which s was exclusively used in the later periods.[5]

Basically Kim's solution sticks to the traditional treatment of the epenthetic s phenomena. Kim'st t-epenthesis rule represents this epenthetic letter s. This Kim's t is, as it happens, provided with a weapon, i. e., a compound boundary, by Chomsky and Halle who permits considerable abstractness, rather give no constraints on abstractness in phonological analysis. This abstract t of Kim's has to explain everything wherever a compoundary boundary occurs. The results of his analysis demonstrates that the t is too busy, or too weak to take care of tensification, incorporated with the role of boundary. In other words, Kim shows that tensification cannot be captured by any traditional treatment where epenthetic is s assumed to provide input for tensification. This may alsoimpl ythat historical facts may help in synchronic analysis of language, but too much reliance on them may blur synchronic facts.

The alternative solution, on the other hand, is an attempt to capture the role of

5) Ung. Hur, ***Korean Phonology*** (Seoul : Chungomsa, 1965), p.393.

epenthetic s phenomena based on synchronic facts. It may be a break from the traditional treatment of epenthetic s phenomena in Korean; one phonological rule and two morphological rules may capture tensification much more correctly than any other traditional treatment incorporated with epenthetic s.

The alternative solution also shows that the concrete solution of natural generative phonology, which provides the theoretical background with the alternative solution, is more powerful in capturing tensification in Korean than the abstract solution of systematic generative phonology.

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韓國語의 된소리 緊張化

金 順 澤

(1) 本稿는, Chomsky-Halle를 따라 複合 限界에 適用되는 삽입음 規則을 前提로 너무 많은 複合 限界를 羅列하고 있는 일부 論者의 韓國語 된소리 緊張化인 /ㅌ/ 삽입음 限界 現象의 抽象的 解決이 不可能함을 보여 주는데 그 目的이 있다.

(2) 韓國語 子音은 그 語尾에서 中和된다. 즉, 잎, 낱, 부엌 등이 있다. 이를 解決키 위하여 다음과 같은 例示를 들어 본다.

	종래의 方法	筆者의 代案
/봄가리/	/pom++kali/	/pom+kali/
1. /ㅌ/ 삽입 :	pom+t+kali	---------
2. 緊張化 :	pom+t+k'ali	---------
3. 單純化 :	pom+ +k'ali	---------
4. 有聲化規則 :	----------	pomgali
表層形 :	※〔pomk'ari〕	〔pomgali〕

(3) 지금까지의 /ㅌ/ 삽입음에 대한 理論은 傳統的으로 /ㅅ/음 삽입에 依存하고 있으며, 그것으로 모든 複合限界를 說明하려 하지만 결코 不可能함을 알 수 있다.

筆者의 代案으로 自然生成 音韻論의 具体的 解決이 可能하며 生成音韻論의 抽象的 解決에 앞서 /ㅌ/ 緊張化 現象을 좀더 具体的으로 解決함이 現實的이라 할 것이다.