

Mora Assignment and Vowel Shortening¹⁾

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Sohn, Hyang-Sook. 1997. Mora Assignment and Vowel Shortening. *Studies in Phonetics, Phonology and Morphology* 5, 119-139. The purpose of this paper is to provide a moraic analysis of vowel shortening in the Kyungsang dialect, with crucial reference to the syllable weight. This paper argues for a moraic representation in which sonorants are assigned the mora in the coda position whereas obstruents are not. Vowel shortening, then, is equivalent to the loss of a corresponding mora when the mora-bearing unit is resyllabified. This explains why vowel shortening is restricted to the stems ending with sonorant. The shortening contrast in the stems ending with consonant clusters is also examined on the basis of two factors: prosodic licensing of the stem-final segment and its moraic nature. The contrast in coronal vs. noncoronal obstruents suggests that sonority hierarchy be further refined to reflect their different moraicity.

1. Introduction

The present study is concerned with vowel length alternation in the Kyungsang dialect of Korean. In this dialect vowel length is phonemically contrastive both in nouns and in verbs, as shown in (1).

(1) a. ka:pi	'branch'	kaci	'eggplant'
hwa:	'anger'	hwa	'Tuesday'
nu:n	'snow'	nun	'eye'
ma:l	'speech'	mal	'horse'
b. ma:l-ta	'to desist'	mal-ta	'to roll up'
ta:l-ta	'to be heated'	tal-ta	'to weigh'
mu:t-ta	'to ask'	mut-ta	'to bury'
cə:k-ta	'to be little'	cək-ta	'to jot down'
ka:l-ta	'to plow'	kal-ta	'to change'

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mu:l-ta 'to reimburse' mul-ta 'to bite'

Vowel length of the stem remains unchanged in nominal inflection regardless of whether the suffix begins with a vowel or a consonant, as shown in (2).

(2) Stem	-man	'only'	-to	'also'	-(n)an	'Topic'	-i/ka	'Nom.'	Gloss
pi:mi	pi:mi	-man	pi:mi	-to	pi:mi	-an	pi:mi	-i	'secret'
sa:ko	sa:ko	-man	sa:ko	-to	sa:ko	-nan	sa:ko	-ka	'accident'
hwa:	hwa:	-man	hwa:	-to	hwa:	-nan	hwa:	-ka	'anger'
ma:l	ma:l	-man	ma:l	-to	ma:l	-an	ma:l	-i	'speech'
ka:n	ka:n	-man	ka:n	-to	ka:n	-an	ka:n	-i	'liver'

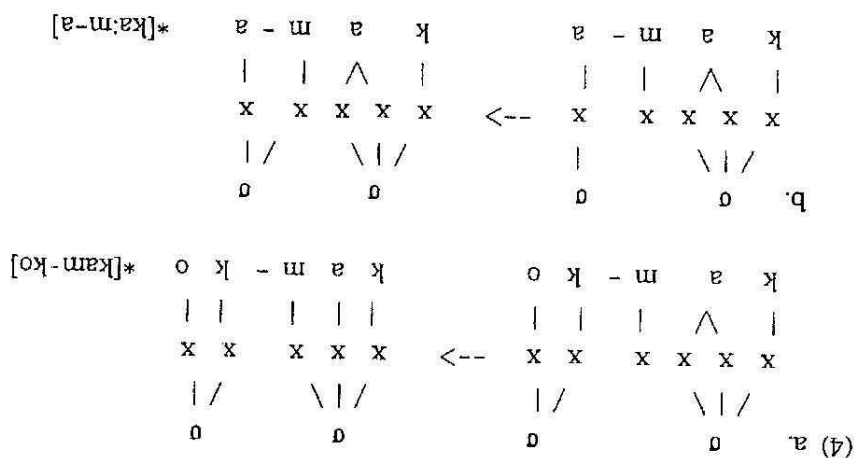
The only place in nominal morphology where vowel length alternation is observed is the derivational process of noun compounding such as [nu:nsalam] 'snowman'. Long vowel in the second stem [sa:lam] 'man' becomes short when the stem is preceded by another stem to form a compound. Vowel shortening in this case is not phonologically conditioned.

In verbal inflection, however, an underlyingly long vowel in stem becomes short before the vowel-initial suffix; this alternation is not observed before the consonant-initial suffix, as shown in (3).

(3) Declarative	Connective	Stative	Effective		
si:n-ta	si:n-ko	sin-a	sin-ini	'to put on (shoes)'	
a:n-ta	a:n-ko	an-a	an-ini	'to embrace'	
ka:m-ta	ka:m-ko	kam-a	kam-ini	'to wash (hair)'	
ta:m-ta	ta:m-ko	tam-a	tam-ini		'to put (in the container)'
pu:l-ta	pu:l-ko	pu-l-a	pu:-ni	'to blow'	
pi:l-ta	pi:l-ko	pi-l-a	pi:-ni	'to pray'	

Peculiar is that long vowel becomes short before the vowel-initial, but not consonant-initial suffixes. In light of the analysis of vowel shortening resorting to the syllable template in which a syllable may occupy limited number of segments (Borowsky 1986, 1989; Itô 1986,

1989), vowel length alternation in (3) is rather unexpected in that long vowel syllables do not shorten when they are closed by a consonant, while they undergo shortening when they are not. Suppose that maximum number of syllable rime is two. In case where the stem is followed by a consonant-initial suffix as in (4a), long vowel should become short, while in case where the stem is followed by a vowel-initial suffix as in (4b), long vowel in the stem should remain intact since the stem-final consonant will be resyllabified as the onset of the following syllable.



Thus, the account crucially referring to the number of skeletal slots predicts wrong forms *[kam-ko] and *[kam-a]. Alternatively, if we suppose that the number of segments in syllable rime may not exceed three, [kam-ko] will be correctly predicted but there is no reason why shortening should take place in (4b). Thus, the incorrect form *[kam-a] is predicted. This suggests that vowel shortening in the Kyungsang dialect be treated in a different way from the shortening in English. The shortening contrast between *keep* vs. *kept*, *dream* vs. *dreamt*, *kneel* vs. *kneelt* is accounted for by resorting to the restriction of English that imposes bpositional limit on syllable rimes, in conjunction with additionally allowing a final extrasyllabic consonant (Borowsky 1986, 1989; Myers 1987).

While shortening takes place before the vowel-initial suffix as illustrated in the stative and effective forms in (3), not all stems with a

long vowel undergo vowel shortening; it is only stems ending with sonorants that are subject to vowel shortening. Long vowel in the stems ending with obstruents does not alternate, as shown in (f).

(5) Declarative	Connective	Stative	Effective	
ca:k-ta	ca:k-ko	ca:k-a	ca:k-ini	'to be little'
ca:k-ta	ca:k-ko	ca:k-a	ca:k-ini	'to be small'
ko:p-ta	ko:p-ko	ko:p-a	ko:p-ini	'to be pretty'
swi:p-ta	swi:p-ko	swi:p-a	swi:p-ini	'to be easy'

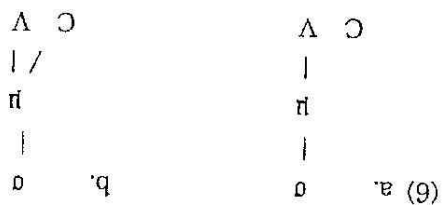
The forms in (5) contrast with those in (3) in that the former does not undergo shortening before the vowel-initial suffix. This suggests that vowel shortening as a process changing the shape of syllable structure be treated as depending on syllable weight rather than on the number of segments. That is, the shortening contrast reduces to a matter of whether the stem-final segment is sonorant or obstruent.

This paper argues that vowel shortening is closely related to the moraic status of the stem-final segment, and that sonorants are assigned the mora in the coda position whereas obstruents are not, hence conforming to the universal sonority constraint, as claimed in Zec (1988). The claim, then, is that in the Kyungsang dialect mora is not uniformly assigned to coda consonants, but is assigned by a language-specific rule selecting only particular set of consonants as moraic.

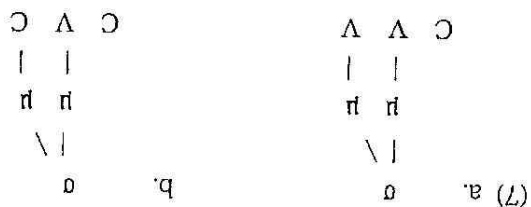
2. Representation of Moraic Structure

In the recent literature on moraic phonology the representation of moraic structure has been controversial. The general consensus is that vowels are underlyingly associated with moras (short vowels with one mora and long vowels with two), and that onsets do not contribute to the weight of syllable. In this study the weightlessness of onset units is represented by direct adjunction of segments to the syllable node, as in (6a). Although the adjunction of onsets directly to the first mora as in (6b) might be equally plausible, the present study advocates the adjunction of onsets directly to the syllable node since consonants in

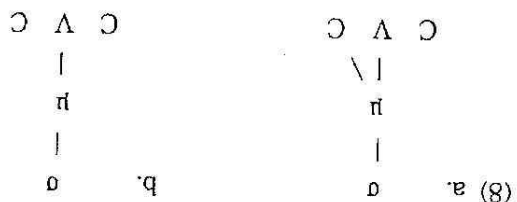
the onset do not count as moraic.



Under the Strict Layer Hypothesis in a theory such as that of Hyman (1985), all segments have underlying weight units, and the universal Onset Creation Rule removes the mora from a prevocalic consonant. On the contrary, in Hayes (1989, 1995) onsets start out as weightless since consonants receive their moraic value in the coda position by the language-specific rule of Weight-by-Position (henceforth, WBP). Thus, CVC can be represented either mono- or bimoraic. In languages where WBP assigns a mora to any consonant in coda position, CVC is equivalent to CVV with respect to the syllable weight, as required for the account of the English, Latin, and Arabic stress system.



By contrast, in languages where WBP fails to apply, CVC has the same syllable weight as CV, as motivated in languages of Mongolian, Huasteco, and Lardil. In this type of languages, representational indeterminacy arises concerning whether the coda consonant is adjoined to the mora dominating the nuclear vowel as in (8a) or directly to the syllable node as in (8b).



In the literature of Korean phonology, the issue concerning the moraic status of coda consonants has been highly controversial: one is to claim that moras are assigned to all the consonants in the coda position by WBP so that partial reduplication can be properly accounted for (Jun 1994). The other is to restrict the assignment of the mora to geminate consonants in order to account for the blocking effect of these consonants in umlaut, in contrast with transparency of the rest of the consonants, as argued by Lee (1991) and Davis (1994). In between these two extremes is the claim in Shim (1996) that obstruents are moraic, while sonorants are weightless, veering exactly to the opposite to the sonority hierarchy postulated by Vennemann (1988) and Zec (1988).

Instead of interpreting all the consonants in coda position as either moraic or weightless across-the-board, languages may identify only particular consonants as undergoing WBP, as claimed by Hyman (1985) and Zec (1988). Their claim is that whether a consonant may bear a mora or not is constrained by the sonority, and consonants that may be moraic units in a language are more sonorous than those that cannot. The gradient system of the units necessary for the description of syllable weight is illustrated in (9), following Vennemann (1988) and Zec (1988).

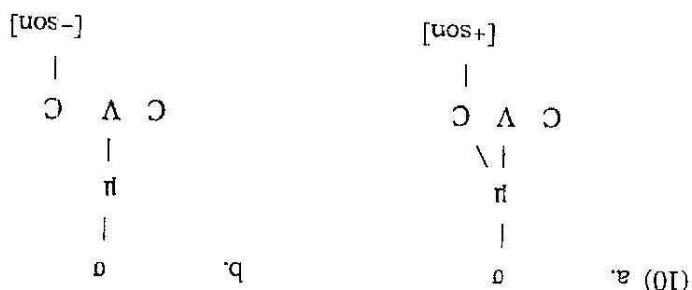
(9) Sonority Hierarchy

Vowel > Glide > Sonorant > Obstruent

Given the sonority hierarchy, the moraicity of a particular language is defined by restricting the set of possible mora-bearing units to those above a particular point in the sonority scale. Thus, the moraicity of sonorants automatically implies that of both vowels and glides, but not vice versa. With respect to the vowel length alternation, I propose that in the Kyungsang dialect sonorants are assigned moras in coda position, while obstruents are not.

Obstruents which are not assigned the mora in the coda position by WBP are directly adjoined to the syllable node since they are weightless. By contrast, sonorants are moraic, hence they are expected to receive their own moras. However, sonorants are banned from augmenting a mora in the same way as vowels do in (7a), although

they are given weight by the WBP. That is, CVC where C in coda position is sonorant is not represented as the moraic structure in (7b). Thus, the present study proposes to make use of two minimally contrastive representations in (8) in the phonology of the Kyungsang dialect, and to draw a representational distinction between moraic and non-moraic segments by adjoining the segment to the mora node as in (8a), or alternatively adjoining directly to the syllable node as in (8b). As a consequence, syllables closed by a sonorant are mora-dominated as in (10a), while those closed by an obstruent are syllable-dominated as in (10b).



Following Steriade (1991) and McCarthy and Prince (1993), it is assumed that syllables are limited to an upper bound of two moras. Given that sonorants are moraic, while obstruents are not in the Kyungsang dialect and that long vowels occupy two moras, long vowel syllables closed by sonorant make three moras, violating the upper bound limit of a syllable. Thus, I propose that the mora anchoring on sonorants merges with its immediately preceding nuclear mora as in (10a), hence rendering two moras into one in case of short vowel and three moras into two in case of long vowels.

3. Moraic Analysis of Vowel Shortening

Having examined the moraic structure of syllable rimes, we now turn to the analysis of vowel shortening. Let us first consider the data in (3) where the stem ends with sonorants. The stem [karm] is represented as in (11a). When the stem is followed by a

(II) a.

k	a	m
\	/	\
μ	μ	μ
	\	
σ	σ	b.

k	a	m	-	k	o
\	/	\			
μ	μ	μ			μ
	\				
σ	σ				σ

(12)

k	a	m	-	a
o	o	u	u	u
		\	\	\
		u	u	u
		u-del.	-->	u
			Resyll. &	u
				o

Now let us consider the apparent counterexamples of the effective forms in (3) where the stem-final vowel is long as in [pui] and [pi:ni], although the stem ends with sonorant. This is essentially due to the stem-final [i] which is deleted before the *f*-initial suffix². It is assumed here that deletion of [i] operates in the segmental level, and hence that the mora remains as a prosodic unit, as shown in (13b). Thus, deletion of [i] is distinguished from resyllabification of [i] which triggers deletion of the mora: for example, the stative forms [pui-e] and [pi:-e] are derived from resyllabification deleting a mora. The application of *i*-deletion in turn feeds *f*-deletion, whereby the unmarked

⁷This process is independently required in Korean phonology. See Sohn (1985) for a detailed discussion.

morpheme boundary³, yielding [pu:-ni] in (13c).

(13) a. $\begin{array}{c} p \\ n \\ \backslash \backslash \\ n \\ \backslash \\ n \\ \backslash \backslash \\ o \end{array}$ b. $\begin{array}{c} p \\ n \\ \backslash \backslash \\ n \\ \backslash \\ n \\ \backslash \backslash \\ o \end{array}$ c. $\begin{array}{c} p \\ n \\ \backslash \backslash \\ n \\ \backslash \\ n \\ \backslash \backslash \\ o \end{array}$

Thus, the apparent counterexamples to vowel shortening in *l*-final stems in (3) are dealt with by separate processes, namely, *l*-deletion followed by deletion of the suffix-initial vowel [i]. Long vowel in the stem remains intact; it is not derived from compensatory lengthening arising from the deletion of [i]⁴.

The fact that liquid is adjoined to the mora node is supported by the paradigm in (14) illustrating dialectal variation.

(14) Stem		Effective	
pu:l	pu:-ni	~	pul-ini
cu:l	cu:-ni	~	cul-ini
mi:l	mi:-ni	~	mil-ini
ki:l	ki:-ni	~	kil-ini

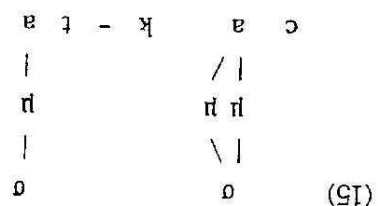
'to blow', 'to decrease', 'to push', 'to be long'

The forms which do not undergo the deletion of the stem-final [l] before the suffix-initial vowel [i] are subject to vowel shortening. This lends supporting evidence to the claim that the mora is lost in the process of resyllabification of the mora-bearing unit into the weightless onset position, as in (12).

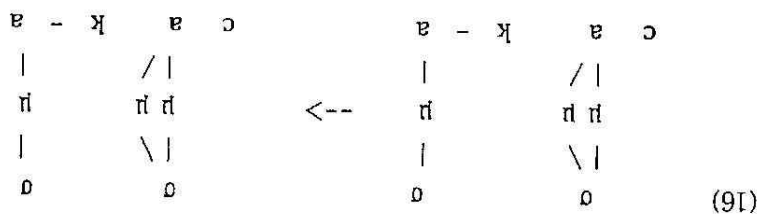
we now move to the cases in (5) where the stem ends with obstruents and there is no vowel length alternation throughout the

³Postlexical application of *f*-deletion triggers compensatory lengthening, whereas its lexical application does not (Sohn 1986; Kim-Renaud 1986).
 'The fact that compensatory lengthening is not involved can be attested by stems ending with vowels when they are adjacent to the suffix-initial [ɲ]. Compare [ka-nɪ] (not *[ka:-nɪ]; 'to go') from /ka-nɪ/ with [ka:-nɪ] ('to plow') from /ka:-nɪ/.

paradigm. Take, for example, [ca:k-ta] and [ca:k-ta] is represented as (15), where weightlessness of the stem-final obstruent is represented by direct adjunction to the syllable node.



Resyllabification does not take place since the suffix begins with a consonant, and hence long vowel in the stem remains intact. On the other hand, in cases where the stem is followed by the vowel-initial suffix as in (16), the stem vowel remains long although the stem-final consonant is resyllabified as the onset of the suffix-initial syllable. Resyllabification of the stem-final obstruent into the onset in (16), unlike the one in (12), does not result in moraic restructuring since obstruent is weightless anyway in the Kyungsang dialect.



In spite of the application of resyllabification, there is no loss of a mora and vowel shortening does not take place. This explains why long vowel in the stem systematically shows up in the surface when it is closed by obstruent. The present analysis in which vowel length alternation is closely related to resyllabification, in conjunction with the moraic nature of the stem-final segment, is capable of predicting the fact that vowel length alternation is observed only when the long vowel is located in the final syllable of the stem, and the prediction is borne out, as illustrated by the data in (17).

(17)	Declarative	ha:lt'it-ta	ha:lt'it-a	'to speak ill of'
		a:lmac-ta	a:lmac-a	'to be appropriate'
		na:mchi-ta	na:mchy-a	'to overflow'
		p'i:t'ul-ta	p'i:t'ul-a	'to be skewed'
		a:cilap-ta	a:cilap-a	'to be dizzy'
		sa:lap-ta	sa:lap-a	'to be sorrowful'
		hæ:lop-ta	hæ:lop-a	'to be harmful'

Since resyllabification takes place across the morpheme boundary, non-final syllables are immune to prosodic restructuring regardless of whether the suffix begins with a vowel or a consonant. To summarize, the present study has argued that vowel shortening in the Kyungsang dialect is best accounted for when it is treated as a process dependent upon syllable weight rather than on the number of segments. Unlike the sort of vowel shortening generally associated with a bimoraic limit on syllables whereby long vowels shorten in closed syllables, those in the Kyungsang dialect shorten in open syllables. This provides justification for a prosodic interaction arising from resyllabification and its consequent loss of a mora.

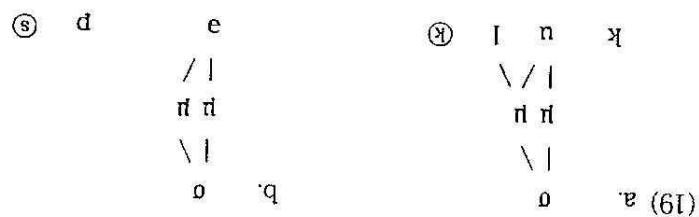
4. Vowel Shortening and Consonant Clusters

The moraic analysis of vowel shortening advocated in this study has some bearing on the stems ending with consonant clusters. Consider the data in (18), where the stem-final consonant is obstruent and there is no vowel length alternation throughout the paradigm.

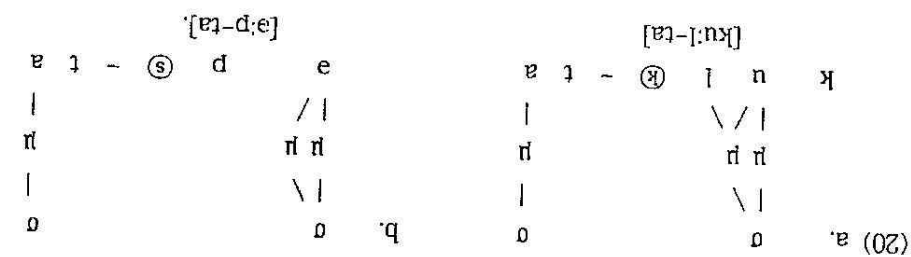
(18)	Stem	Declarative	Stative	Effective
	ku:lk	ku:l-ta	ku:lk-a	ku:lk-ini
	sa:lp	sa:l-ta	sa:lp-a	sa:lp-ini
	t'a:lp	t'a:l-ta	t'a:lp-a	t'a:lp-ini
	a:ps	a:p-ta	a:ps-a	a:ps-ini
				'not to exist'
				'to taste bitter'
				'to be sorrowful'
				'to be thick and strong'

The stems [ku:lk] and [a:ps] whose vowel length does not alternate

before the vowel-initial suffix are represented as in (19).



The representation in (19) where the stem-final obstruents are not adjoined to the prosodic structure is supported by the fact that the stem-final obstruent does not surface, as indicated by the derivative forms in (18), when there arises a sequence of three consonants due to the consonant-initial suffixation. The representation in (19) accounts for this fact by simply deleting the prosodically unlicensed material which is subject to the Stray Erasure, as illustrated in (20). This explains why bimoraic stem-final syllable does not undergo shortening: since resyllabification is not applicable in (20), the existing moraic structure does not change.



As the stem-final segment in (19) is neither mora-bearing unit nor is it adjoined to the prosodic structure, it stands in the way of resyllabifying the prosodically licensed stem-final consonant before the vowel-initial suffix, as illustrated in (21). Thus, the prosodically unlicensed segments are incorporated into the onset position, which does not affect the existing moraic structure of the stem-final syllable. As a consequence, vowel shortening does not take place.

Now consider the data in (22), where the stem-final consonant cluster consists of two sonorants of liquid followed by nasal. Unlike the data in (18), the stem-final long vowel systematically shortens before the vowel-initial suffix.

(22)	Stem	ca:lm	ca:m-ta	calm-a	calm-ini	'to be young'
	Declarative	ta:lm	ta:m-ta	talm-a	talm-ini	'to resemble'
		ko:lm	ko:m-ta	kolm-a	kolm-ini	'to fester'
		sa:lm	sa:m-ta	salm-a	salm-ini	'to boil'

Note here that in declarative forms it is the stem-final nasal, not the liquid immediately following the stem vowel, that surfaces in a clustering of three consonants when followed by a consonant-initial suffix. Thus, I suggest that the moraic structure of the stem be represented as (23a), where noncoronal nasal is incorporated into the moraic structure, stranding the coronal liquid in the middle.

(23) a.

t	a	①	m
/			
μ			
\			
σ			

b.

t	a	①	m	-	t	a
/						
μ						
\						
σ						

[ta:m-ta]

Affixation of the consonant-initial suffix as in (23b) does not trigger prosodic restructuring and [l] remains unincorporated into the moraic structure. Thus, vowel shortening does not take place and [l] is not licensed to surface, yielding [ta:m-ta].

syllable, as shown in (24a). As a parallel to resyllabification in (12), the second mora of the stem is deleted in the process of creating the onset, hence resulting in shortening of the stem vowel. Unlike the liquid stranded in (23b), the one in (24a) can now be adjoined to its preceding nuclear mora since it is assigned the mora by WBP after resyllabification takes place. Thus, the prosodically unlicensed [l] is incorporated into the moraic structure, hence yielding [taln-a] as illustrated in (24b).

(24) a.		t a ① m - a	
o			
o	μ	μ	
		μ	
	adjunction	-->	
b.		t a l m - a	
o			
o	μ	μ	
	adjunction	-->	
		[taln-a]	

It has been shown that the shortening contrast in the stems ending with consonant clusters is determined by two factors: one is whether the stem-final segment is prosodically licensed or not and the other is whether the segment is moraic if prosodically licensed. Thus, as in the consonant-final stems, vowel shortening in the stems ending with consonant clusters crucially refers to the nature of adjunction of the stem-final segment.

5. Mora Licensing and Apparent Counterexamples

In the Kyungsang dialect, there is a class of stems ending with obstruent, whose vowel length unexpectedly alternates before the vowel-initial suffix. (Refer to the data in (5).)

(25) Declarative Connective Stative

ku:p-ta	ku:p-ko	kup-a	Kyungsang	kuw-a	Seoul
ci:p-ta	ci:p-ko	cip-a		kiw-a	
ta:p-ta	ta:p-ko	tap-a		lew-a	

Compared with the data in (5) whose stem ends with obstruents and

yet does not show vowel length alternation, those in (25) apparently constitute counterexamples to vowel shortening, behaving as if they were sonorant-final.

Essentially following the proposal made in Sohn (1985) that [p] is derived from the underlying /w/, I propose that the stem-final [p] be adjoined to the mora node rather than to the syllable node, as sketched in (26a).

(26) a.									
o	\	u	\	o	\	u	\	o	\
u	u	u	u	u	u	u	u	u	u
p	/ \	p	/ \	p	/ \	p	/ \	p	/ \
k	k	k	k	k	k	k	k	k	k
b.									
o	\	u	\	o	\	u	\	o	\
u	u	u	u	u	u	u	u	u	u
p	/ \	p	/ \	p	/ \	p	/ \	p	/ \
k	k	k	k	k	k	k	k	k	k
c.									
o	\	u	\	o	\	u	\	o	\
u	u	u	u	u	u	u	u	u	u
p	/ \	p	/ \	p	/ \	p	/ \	p	/ \
k	k	k	k	k	k	k	k	k	k

Given the representation in (26a) where the stem-final obstruent is assigned the mora, shortening of the long vowel before the vowel-initial suffix naturally follows: the stem-final mora is deleted as a result of resyllabification. Thus, the vowel length alternation in [ku:p-ta] vs. [kup-e] is due to the moraic representation where the stem-final obstruent is adjoined to the mora node.

The representation in (26a), however, is problematic in that obstruent is adjoined to the mora node. This is a violation of the constraint which bans assigning the mora to obstruents in the Kyungsang dialect.

(27) Mora Licensing

Only sonorants are moraic.

It seems that violation of Mora Licensing in the stems like (25) motivates language change. The representation in (26a) is repaired to satisfy the constraint (27) by changing the segmental feature content rather than reorganizing the prosodic structure--the choice that the Seoul dialect has made⁵. The verbs in (25) form a class of the so-called /p/-irregular verbs in the Seoul dialect where the stem-final

⁵Adjunction of obstruent directly to the syllable node is an alternative strategy to repair the Mora Licensing violation in (26a). Under this repair vowel length alternation is not made possible--the prediction that remains to be attested.

as illustrated in (28a).

(28) Seoul dialect

a.	o	\	ɸ	/ \	k u w
b.	o		ɸ		k u w - e
c.	o	\	ɸ	/ \	k u w - t a [kʷ; p-ta]

When the stem is followed by a vowel-initial suffix as in (23b), the labial glide is resyllabified as the onset, hence shortening the stem vowel. On the other hand, when the stem is followed by a consonant-initial suffix as in (28c), resyllabification is blocked, and the labial glide remains in the coda position, violating the surface constraint which prohibits glides from surfacing in the coda. Thus, the operation delinking [+sonorant] is activated and the labial glide in *[lu:w-ta] surfaces as obstruent ([ku:p-ta])⁶.

following data.

(29)	Declarative	mu:t-ta	mu:k-ko	mur-a	mur-ini	'to ask'
		ka:t-ta	ka:k-ko	kar-a	kar-ini	'to walk'
		nu:t-ta	nu:k-ko	nu-a	nu-ini	'to search'

I assume that [-sonorant] coda as an output of delinking [+sonorant] automatically ascends to be adjoined to the syllable node in the surface due to the pressure of the constraint (27). Thus, in this case there arises conflict between the Mora Licensing and the surface constraint banning the glide in the coda, where the latter wins out.

coda, where the latter wins out.

In the examples in (29) vowel shortening takes place before the vowel-initial suffix. This suggests that the stem-final segments be sonorant, and hence that they be adjoined to the mora node, as sketched in (30a).

(30) a.			b.			c.		
o	\	h h	o		h	o	\	h h
u	/		u			u	/	
n			n			n		
r			r			r		
[mur-a]			[mur-a]			[mur-ta]		

With the representation in (30a) parallel to the one in (28a), vowel shortening in (30b) is dealt with by resyllabifying the stem-final sonorant into the weightless onset position and hence deleting a mora. When the stem is followed by the consonant-initial suffix as in (30c), however, it does not undergo prosodic restructuring. As in the representation in (28c), the representation in (30c) in which the stem-final segment remains in the coda violates the surface constraint that restricts the sonorant [r] as well as the glide [w] to the onset position. The ban on the sonorant [r] in the coda is enforced and the optimized coronal obstruent surfaces⁷.

It has been shown that in the stems in (25) and (29), vowel length alternation is accounted for by assigning the mora to the stem-final obstruent, since in these paradigms the obstruent alternates with the sonorant in some related forms. There is another class of verbs whose stem-final obstruents appear to have moraic value, as illustrated in (31). Unlike the verbs in (5) in which stems closed by obstruent do not show vowel length alternation, stem-final vowels shorten before the vowel-initial suffix; unlike the verbs in (25) and (29), these verbs do not alternate between obstruent and sonorant.

⁷As a parallel to (28c), I assume that the stem-final obstruent [t] is directly adjoined to the syllable node as a consequence of repairing the surface constraint violation.

The stem-final consonants are obstruent; yet insofar as vowel shortening is concerned, they behave as if they were sonorant-final. Therefore, I propose that the stem-final segment be adjoined to the mora node, as illustrated in (32a). Then, vowel shortening naturally follows from resyllabification of the moraic coda consonant into the weightless onset, as shown in (32b).

Resyll. $\begin{array}{c} \text{c} \\ \text{i} \\ \text{c} \\ \text{a} \end{array} \quad \begin{array}{c} \text{c} \\ \text{i} \\ \text{c} \\ \text{a} \end{array}$

The analysis, however, poses a serious challenge to the Mora Licensing (27) to the effect that mora assignment is restricted to sonorants. Stems ending with non-coronal obstruents fail to undergo vowel length alternation as indicated in (5). By contrast, stems ending with coronal obstruents as in (31) are subject to vowel shortening. The contrast in coronal vs. non-coronal obstruents suggests that the sonority hierarchy in (9) be further refined to reflect different sonority of obstruents with respect to the Place⁸.

Vowel > Glide > Sonorant > Coronal Obstruent > Noncoronal Obstruent

"This was first pointed out to me by Gregory Iverson.

That is, moraic value can be licensed to the set of the mora-bearing units above coronal obstruents, hence drawing a moraic vs. non-moracic distinction between coronal and noncoronal obstruents⁹).

6. Conclusion

It has been argued that in the Kyungsang dialect moras are assigned only to a limited set of segments by WBP, depending on the sonority of the consonant, and that the moraic nature of the stem-final segment is defined in such a way that sonorants are assigned the mora, whereas obstruents are not. Vowel shortening in the Kyungsang dialect provides justification for the correlation between the sonority hierarchy and the moraic representation in which sonorants are adjoined to the mora node, while obstruents are directly adjoined to the syllable node. Employing the contrast between mora-dominated and syllable-dominated consonants, and resorting to the assumption that a mora is lost in the process of resyllabifying the moraic segment into the weightless onset position, the present analysis accounts for the shortening contrast in sonorant vs. obstruent. It has been shown that the shortening contrast in the stems ending with consonant clusters is also accounted for by essentially the same mechanism, with reference to the two factors of prosodic licensing of the stem-final segment and its moraic nature.

As for the apparent counterexamples, the present study proposes a more refined scale of sonority. Given the hierarchical sonority distinction between coronal and noncoronal obstruents, the Mora Licensing provides a revised definition of moraicity: moraic value is assigned to coronal obstruents as well as to sonorants. However, not all the evidence from Korean phonology points to the moraicity of sonorant as opposed to obstruent, or sonorant plus coronals as opposed to noncoronal obstruents. Thus, coronal moraicity still needs to be independently motivated in other areas of Korean phonology.

⁹Blocking effect caused by coronal obstruents in umlaut also points to their peculiarity in Korean phonology.

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