

An Optimality-Theoretic Account of Initial Sound Law in Korean, Revisited

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Kim, Tae Sik & Oh, Young-il. (2021). An optimality-theoretic account of initial sound law in Korean, revisited. *The Linguistic Association of Korea Journal*, 29(3), 85-103. This paper investigates exceptions to Initial Sound Law in Korean within the framework of Optimality Theory. The law dictates that some nasal and lateral sounds not be in word-initial position. Even though a recent study (Oh & Kim, 2021) is able to cover fundamental cases of the law, many exceptions have still not been fully explained by the research, such as compounds, derivational words, proper nouns, numbers and bound nouns. Basically based on Oh and Kim (2021), we propose a revised constraint: a sonority difference between C and V in the initial position of a semantic unit should be at least 3 (CV SDiff (SUI ≥ 3)). With the notion of a semantic unit (instead of a word unit), the constraint interacts with other standard markedness and faithfulness constraints and clearly accounts for the limited distribution of the target sounds. The constraint ranking presented is as follows: *Complex (onset) >> Ident-IO (voice) >> CV SDiff (SUI ≥ 3) >> Max-IO >> Ident-IO (manner) >> CV SDiff (SUNI ≥ 3).

Key Words: initial sound law, sonority, semantic unit, optimality theory

1. Introduction

In Korean, Initial Sound Law dictates that some nasal and lateral sounds not be in word-initial position. Consider the following representative examples.

* The first author is Tae Sik Kim and the corresponding author is Young-il Oh.

- (1) /n/ ⇒ Ø
 a. /njəca/ ‘woman’ ⇒ [jəca]/*[njəca]
 b. /namnjə/ ‘man, woman’ ⇒ [namnjə]/*[namjə]
- (2) /l/ ⇒ Ø
 a. /ljaŋsim/ ‘conscience’ ⇒ [jaŋsim]/*[ljaŋsim]
 b. /kæljaŋ/ ‘improvement’ ⇒ [kæljaŋ]/*[kæjaŋ]
- (3) /l/ ⇒ [n]
 a. /lakwən/ ‘paradise’ ⇒ [nakwən]/*[lakwən]
 b. /khwælak/ ‘pleasure’ ⇒ [khwælak]/*[khwænak]

The nasal /n/ is elided when it occurs word-initially as in (1a), but the same sound is fully realized in non-word-initial position as in (1b). Likewise, in (2) and (3), we find the similar pattern that the lateral /l/ does not surface or changes to [n] in word-initial position, but it is not deleted or changed non-word-initially. Basically, we can formulate the following rule for this phenomenon (Sohn, 1999, p. 169; Kang & Lee, 1997, p. 310).

- (4) n, l ⇒ Ø / ____ j, i
 l ⇒ n / ____ V (other than j or i)

Lots of researchers (Kim-Renaud, 1974, David & Shin, 1999, Park, 2010, *inter alia*) have proposed their own analyses to account for Initial Sound Law. The most recent proposal is from Oh and Kim (2021) with the Optimality Theory framework. Oh and Kim’s (2021) explanation mainly focuses on the fundamental cases of the law just described above (e.g., the examples in (1), (2), and (3)). However, their proposal does not fully cover the realization of the nasal and lateral sounds with various conditions. For example, we need more clarification on compounding and affixation.

- (5) Compounding
 /namnjə/ ‘man, woman’ + /loso/ ‘the old, the young’
 ⇒ [namnjənoso]/*[namnjəloso] ‘man, woman, the old, the young’
- (6) Affixation
 /sin/ ‘new’ + /njəsəŋ/ ‘woman’
 ⇒ [sinjəsəŋ]/*[sinnjəsəŋ] ‘(Lit.) new woman’

In (5) and (6), after compounding and affixation, there should be no word boundary between /namŋjə/ and /loso/ (or between /sin/ and /ŋjəsəŋ/). Then, the lateral /l/ in /loso/ (or the nasal /n/ in /ŋjəsəŋ/) should be in non-word-initial position and Initial Sound Law should not be observed, contrary to the fact.

Also, we find an exception with proper nouns. Generally, proper nouns are not immune to the deletion/change of the target sounds.

- (7) a. [səuljəcatəhakkjo]/*[səulŋjəcatəhakkjo]
 Seoul.woman.university
 ‘Seoul Women’s University’
 b. [hannulijəhæŋsa]/*[hannuliljəhæŋsa]
 Hannwuli.tour.company
 ‘Hannwuli tour compnay’

Like compounding and affixation, the nasal sound in /ŋjəca/ and the lateral sound in /ljəhæŋsa/ are not in the word-initial position with these examples. However, unlike our expectation, we find that the sounds are deleted (i.e., we find Initial Sound Law).

Numbers cause an additional problem.

- (8) a. [samsipjuk]/*[samsipljuk]
 thirty.six
 ‘Thirty six’
 b. [oljuk samsip]/*[ojuk samsip]
 five.six thirty
 ‘(Lit.) Five six thirty.’/‘Five times six equals thirty.’

Note that the number six /ljuk/ is pronounced with the lateral in (8b), but the sound should be elided in (8a).

More complicated cases involve bound nouns. Bound nouns in Korean need to have additional words or phrases to be grammatical in a sentence.

- (9) a. cekiey mwulken-i iss-ta.
 there thing-NOM exist-Decl
 ‘There is a thing.’

- b. *cekiey kes-i iss-ta.
 there BN-NOM exist-Decl
- c. cekiey nolan kes-i iss-ta.
 there yellow BN-NOM exist-Decl
 ‘There is a yellow one.’

Lexical nouns such as *mwulken* ‘thing’ can stand alone in a sentence without the aid of other words or phrases (e.g., (9a)), but bound nouns (e.g., *kes* in (9b/c)) should co-occur with aiding words or phrases as illustrated in (9b/c). The classifier, *nyen* [njən] ‘year’, is traditionally categorized as a bound noun given the following similar behavior.

- (10) a. *John-un nyen-ey Mary-lul mann-ass-ta.
 John-TOP year-in Mary-ACC meet-PAST-Decl
- b. John-un 1999 nyen-ey Mary-lul mann-ass-ta.
 John-TOP 1999 year-in Mary-ACC meet-PAST-Decl
 ‘John met Mary in 1999.’

When there is no numeral phrase with the bound noun *nyen*, the sentence is ungrammatical as in (10a). We can remedy the sentence by providing an appropriate numeral phrase as shown in (10b). Interestingly, the bound noun *nyen* does not follow Initial Sound Law.

- (11) *John-un 1999 [jən]-ey Mary-lul mann-ass-ta.
 John-TOP 1999 year-in Mary-ACC meet-PAST-Decl

Observe that when the nasal sound is deleted, the sentence is ungrammatical. Another bound noun example is *li*.

- (12) a. John-i totwukcil-ul ha-l li eps-ta.
 John-NOM theft-ACC do-Adn BN not.exist-Decl
 ‘It is not possible that John stole (something).’
- b. *li-ka eps-ta.
 BN-NOM not.exist-Decl

The bound noun *li* also needs to have some words or phrases. Otherwise, the sentence becomes ungrammatical as shown in (12b). We do not find Initial Sound Law with the bound noun *li*.

- (13) *John-i totwukcil-ul ha-l [i] eps-ta.
 John-NOM theft-ACC do-Adn BN not.exist-Decl

We find that when the lateral sound is not pronounced, the sentence becomes ungrammatical.

In this paper, we will propose a more refined constraint that fully covers those typical exceptions within OT, by modifying the proposal given in Oh and Kim (2021). In the next section, we will review Oh and Kim (2021) and point out their problems with the exceptions. In section 3, we will propose another constraint that accounts for the exception as well as the basic phenomena (e.g., (1)/(2)/(3)). In section 4, we will discuss the implication of the proposal. Section 5 will conclude this paper.

2. Oh and Kim (2021) and Their Problems

Oh and Kim (2021) argue that the application of Initial Sound Law is mainly due to a sonority difference between the target sound (e.g., the lateral and nasal sounds) in word-initial position and the following vowel. They claim that the difference between the two sounds should be at least three based on the following sonority hierarchy.

- (14) Sonority Hierarchy
- | | |
|----------------------|---|
| Non-High Vowels | 8 |
| High Vowels/Glide | 7 |
| Liquids | 6 |
| Nasals | 5 |
| Voiced Fricatives | 4 |
| Voiceless Fricatives | 3 |
| Voiced Stops | 2 |
| Voiceless Stops | 1 |

The related constraints and their ranking are as follows:

(15) Constraints (Oh & Kim, 2021)¹⁾

- a. *Complex (onset): Onsets are simple. (Kager, 1999, p. 97)
- b. CV SDiff (WI ≥3): The sonority difference between C and V in word-initial position must be a minimum of 3.
- c. CV SDiff (NWI ≥3): The sonority difference between C and V in non-word-initial position must be a minimum of 3.
- d. Max-IO: Input segments must have output correspondents. (Kager, 1999, p. 67)
- e. Ident-IO (manner): The specification for manner of articulation of an input segment must be preserved in the output correspondent. (Kager, 1999, p. 45)
- f. Ident-IO (voice): The specification for the feature [voice] of an input segment must be preserved in the output correspondent. (Kager, 1999, p. 14)

(16) Hypothesized Ranking

*Complex (onset) >> Ident-IO (voice) >> CV SDiff (WI ≥3) >> Max-IO >> Ident-IO (manner) >> CV SDiff (NWI ≥3)

Let's go over the analysis of the examples in (2).

(17) [jaŋsim] in (2a)

/ljaŋsim/	*Complex (onset)	Ident-IO (voice)	CV SDiff (WI ≥3)	Max-IO	Ident-IO (manner)	CV SDiff (NWI ≥3)
a. ljaŋsim			**! (WI:1)			
b. [ɾ]jaŋsim				*		
c. njaŋsim			*! (WI:2)		*	
d. tjaŋsim		*!			*	

The candidate (17a) violates the crucial constraint CV SDiff (WI ≥3)—the word initial position is occupied by [l] (the sonority index of 6), the following sound is [j] (the sonority index of 7), and the difference between the two is 7 - 6 = 1. Thus, the candidate is given two gradient violations (e.g., 3-1 = 2). The candidate (17c) also violates the same constraint: [n] has the sonority index of 5, and the sound next to it has the sonority index of 7. Accordingly we find 2 differences (7-5), and we have one violation (e.g., 3-2 = 1). Additionally,

1) Due to page limit, we are unable to explain motivation/rationale for the crucial constraints such as (15b) and (15c) given in Oh and Kim (2021). Interested readers are referred to Oh and Kim (2021) and references therein for further details.

the candidate (17c) is also problematic in that it disobeys Ident-IO(manner) (e.g., the change of manner of articulation feature). With (17d), even though the candidate does not have any problem with the sonority in the word-initial position, it violates more highly-ranked Ident-IO(voice) (and Ident-IO(manner)). On the other hand, the candidate (17b) does not violate highly ranked constraints CV SDiff ($WI \geq 3$) and Ident-IO(voice), even though it has a problem with the deletion (e.g., Max-IO). Thus, it is chosen as an optimal output.

Next, consider the analysis of (2b) in which we do not find any application of Initial Sound Law.

(18) [kæljaŋ] in (2b)

/kæljaŋ/	*Complex (onset)	Ident-IO (voice)	CV SDiff ($WI \geq 3$)	Max-IO	Ident-IO (manner)	CV SDiff ($NWI \geq 3$)
a. $\text{ᄒ}kæljaŋ$						** (NWI:1)
b. $kæjaŋ$				*!		
c. $kæŋjaŋ$					*!	* (NWI:2)
d. $kætjaŋ$		*!			*	

The candidate (18b) violates Max-IO due to the deletion of the lateral sound. The candidate (18c) is also ill-formed because the manner of articulation has changed (from the lateral to the nasal). It further violates the most lowly ranked constraint CV SDiff ($NWI \geq 3$); the sonority difference between [j] and [ŋ] in non-word-initial position is 2. In the case of the candidate (18d), we find two violations—the highly-ranked voice constraint and the lowly-ranked manner constraint—owing to the change from the lateral sound to the voiceless stop sound. Thus, (18a) surfaces as an optimal output; it only violates the lowest constraint CV SDiff ($NWI \geq 3$).

Problematic cases come from the various exceptions given in the previous section. Consider the case from compounding in (5).

(19) [namŋjənosŋ] in (5)

/namŋjənosŋ/	*Complex (onset)	Ident-IO (voice)	CV SDiff ($WI \geq 3$)	Max-IO	Ident-IO (manner)	CV SDiff ($NWI \geq 3$)
a. $\text{ᄒ}namŋjənosŋ$						** (NWI:1)
b. $namŋjənosŋ$				*!		
c. $\text{ᄒ}namŋjənosŋ$					*!	* (NWI:2)
d. $namŋjətŋ$		*!			*	

Due to the deletion of the lateral sound, the candidate (19b) is out (i.e., Max-IO is relatively high). The candidate (19c) cannot be tolerable either, since we find the change of the manner of articulation (from the lateral *l* to nasal *n*). The candidate (19d) is clearly ill-formed because it violates the highly-ranked voice constraint. Supposedly, (19a) should be chosen as an optimal output since it only violates the lowest-ranked sonority restriction in the non-word-initial position (a \otimes symbol indicates the incorrect winner). However, (19c) is a grammatical form instead of (19a).

Further consider the analysis for (12a) and (13) with the bound noun *li*.

(20) The bound noun *li*

/li/	*Complex (onset)	Ident-IO (voice)	CV SDiff (WI \geq 3)	Max-IO	Ident-IO (manner)	CV SDiff (NWI \geq 3)
a. \otimes li			**! (WI:1)			
b. \otimes i				*		
c. ni			*! (WI:2)		*	
d. ti		*!			*	

The candidate (20d) is clearly out due to the change of voicing feature, and Ident-IO(voice) is the second highest constraint. Both (20a) and (20c) violate the minimum sonority constraint in the word-initial position. The optimal output is supposed to be the candidate (20b) because it only violates Max-IO, which is lower than CV SDiff (WI \geq 3). However, we find an ungrammatical sentence with the supposedly-optimal candidate [i] in (20b) as shown in (13), repeated here as (13').

(13') *John-i totwukcil-ul ha-l [i] eps-ta.
 John-NOM theft-ACC do-Adn BN not.exist-Decl

By the same token, Oh and Kim (2021) cannot fully account for the rest of the exceptions given in the introduction section (e.g., the affixation and number). In the next section, we will propose another constraint that can overcome the problems in Oh and Kim (2021).

3. Semantic-Unit-Initial Instead of Word-Initial

We revise the important constraints in Oh and Kim (2021) as follows.

(21) Revised Constraints

- a. CV SDiff (SUI ≥ 3): The sonority difference between C and V in the initial position of a semantic unit must be a minimum of 3.
- b. CV SDiff (SUNI ≥ 3): The sonority difference between C and V in the non-initial position of a semantic unit must be a minimum of 3.
- c. Hypothesized Ranking
 *Complex (onset) \gg Ident-IO (voice) \gg CV SDiff (SUI ≥ 3) \gg Max-IO \gg Ident-IO (manner) \gg CV SDiff (SUNI ≥ 3)

(22) The formal definition of a semantic unit

A semantic unit is the largest unit of meaning which includes more than literal meaning (e.g., a pragmatic effect) if there is any. On the other hand a morphemic one is the smallest unit of meaning which contains only literal meaning. A semantic unit is greedy, but a morphemic unit is lazy in the sense of greedy/lazy in regular expression.

Let's start with the compounding example (5).

(23) [namnjənosɔ] (compounding)

$\langle \text{namnjə} \times \text{losɔ} \rangle$	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥ 3)	Max -IO	Ident-IO (manner)	CV SDiff (SUNI ≥ 3)
a. namnjəlosɔ			*! (SUI:2)			* (SUNI:2)
b. namnjəosɔ				*! (o)		* (SUNI:2)
c. na namnjənɔsɔ					* (no)	* (SUNI:2)
d. namnjətɔsɔ		*!			* (to)	* (SUNI:2)
e. namnjəlosɔ			*! (SUI:2)	* (jə)		
f. namnjəosɔ				**! (jə,o)		
g. namnjənɔsɔ				*! (jə)	* (no)	
h. namnjətɔsɔ		*!		* (jə)	* (to)	
i. namljəlosɔ			*! (SUI:2)		* (ljə)	** (SUNI:1)
j. namljəosɔ				*! (o)	* (ljə)	** (SUNI:1)
k. namljənɔsɔ					**! (ljə,no)	** (SUNI:1)
l. namljətɔsɔ		*!			** (ljə,to)	** (SUNI:1)

The semantic unit boundary is indicated with less than sign (<) and greater than sign (>). /namnjə/ is one semantic unit and /loso/ is another semantic unit. Note that the concept of a semantic unit can differ from that of a morpheme. /nam/ and /njə/ in /namnjə/ contrast with each other and semantically /namnjə/ signals a contrastive meaning. We find the similar effect with /lo/ and /so/ in /loso/ (e.g., the old vs. the young). Thus, <namnjə> forms one semantic unit and <loso> another.²⁾ The candidate (23a) violates CV SDiff (SUI ≥ 3) because the lateral sound is in the initial position of the second semantic unit. It also violates the lowly-ranked CV SDiff (SUNI ≥ 3) since the nasal sound is the onset of the second syllable and is located in the non-initial position of the first semantic unit. The candidate (23b) is also out due to the deletion of the initial lateral sound of the second semantic unit. (23d) is ill-formed due to the change of the voicing feature. (23c) is an optimal output even though we find that the manner feature changes and the sonority difference between C and V is less than 3 in the non-initial position of the first semantic unit.³⁾

Next is the affixation example (6).

(24) [sinjəsəŋ] (affixation)

<sin><njəsəŋ>	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥ 3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥ 3)
a. sinjəsəŋ			*! (SUI:2)			
b. sin jəsəŋ				*		
c. sinljəsəŋ			**! (SUI:1)		*	
d. sintjəsəŋ		*!			*	

/sin/ is one semantic unit with the meaning of *new*, and /njəsəŋ/ is also another semantic unit. As the tableau shows, all the other candidates except (24b) violate either the sonority constraint in the initial position of the semantic unit or the more

2) Some might argue that the compound /namnjəloso/ can be divided into four semantic units (e.g., <nam><njə><lo><so>) following the notion of a morpheme. However, given the definition of a semantic unit in (22), the division should be <namnjə><loso>, but not <nam><njə><lo><so>, since we find a contrastive meaning between man and woman and also between the old and the young. Recall that a semantic unit is greedy so it tries to have more than literal meaning if there is any (like this example).

3) Due to page limit, we do not explain all the possible candidates in (23). Readers are invited to examine the rest candidates by themselves.

highly-ranked voice constraint. On the other hand, (24b) only violates Max-IO which is about deletion and is ranked relatively low. Thus, (24b) is a surface form.

Proper nouns in (7a/b) can be analyzed properly with the given proposal, too. We can divide the semantic unit of (7a/b) as follows.

- (25) a. Input: <səul><njəca><təhakkjo>
 Output: [səuljəcatəhakkjo]/*[səulnjəcatəhakkjo]
 Seoul woman university
 ‘Seoul Women’s University’
- b. Input: <hannuli><ljəhæŋsa>
 Output: [hannulijəhæŋsa]/*[hannulijəhæŋsa]
 Hannwuli tour.company
 ‘Hannwuli tour company’

Observe that in the input (e.g., /njəca/ and /ljəhæŋsa/), the nasal and lateral sounds are in the initial position of the semantic unit, and thus the output is realized with the deletion of the nasal and lateral sounds following Initial Sound Law, as shown below.

(26) [hannulijəhæŋsa] in (25b)

/<hannuli><ljəhæŋsa>/	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥ 3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥ 3)
a. hannulijəhæŋsa			**! (SUI:1)			** (SUI:1)
b. h hannulijəhæŋsa				*		** (SUI:1)
c. hannulinjəhæŋsa			*! (SUI:2)		*	** (SUI:1)
d. hannulitjəhæŋsa		*!			*	** (SUI:1)

Furthermore, the sonority constraint combined with the semantic unit works very well with the numbers in (8).

- (27) a. Input: <samsip> <ljuk> ⇒ Output: [samsipjuk]/*[samsipljuk]
 thirty.six
 ‘Thirty six’
- b. Input: <oljuk> <samsip> ⇒ Output: [oljuk samsip]/*[ojuk samsip]
 five.six thirty
 ‘(Lit.) Five six thirty.’/‘Five times six equals thirty.’

In (27a), we have the number 36. The semantic unit can be decomposed into <samsip> ‘30’ and <ljuk> ‘6’. The Sino-Korean word /ljuk/ starts with the lateral sound in the initial position of the semantic unit, and the violation cannot be tolerated. Accordingly, the optimal output is with the deletion of the lateral sound. On the other hand, in (27b) with /oljuk/ we find one semantic unit. As stated earlier, we need to distinguish a semantic unit from a morphemic unit. Morphologically, oljuk has a morphemic boundary between /o/ and /ljuk/ (i.e., o#ljuk). However, /oljuk/ does not denote the simple (or literal) number 5 and 6. Instead, it means 5 *times* 6. Thus, the proper semantic unit is <oljuk>—which includes the multiplication meaning—rather than <o><ljuk>. We find the same semantic effect when we read numbers.

- (28) a. The number 26
 [isipjuk]/*[isipljuk]
 twenty.six
 ‘Twenty six’
- b. The sequence of the number 2 and 6
 [iljuk]/*[ijjuk]
 two.six
 ‘(Lit.) Two six’

Basically, we have two different ways to read numbers. One is to read numbers based on the mathematical notion. For example, when you read 26 as [isipjuk], that means 20 + 6. In this example, the semantic unit is <isip><ljuk> following the mathematical notion 20 and 6. However, if we say /iljuk/, it literally means *two six* instead of *twenty six*. In this case, the semantic unit is just <iljuk>. Bear this in mind, and consider the following tableau.

(29) [isipjuk] ‘twenty six’

/<isip><ljuk>/	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥ 3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥ 3)
a. isipljuk			**! (SUI:1)			
b. [isip]juk				*		
c. isipnjuk			*! (SUI:2)		*	
d. isiptjuk		*!			*	

In (29a), since the lateral sound is in the initial position of the second semantic unit, we find the sonority violation. (29c) also has the similar problem with the CV SDiff (SUI ≥ 3). (29d) is out due to the highly-ranked voice constraint. (29b) is chosen as an optimal output since it only violates Max-IO, which is lower than Ident-IO(voice) and CV SDiff (SUI ≥ 3). However, the semantic unit decomposition is different in the case of (28b).

(30) [iljuk] ‘(Lit.) two six’

/<iljuk>/	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥ 3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥ 3)
a. [iljuk]						** (SUNI:1)
b. ijuk				*!		
c. injuk					*!	* (SUNI:2)
d. itjuk		*!			*	

As shown in this tableau, the candidate (30a) is realized as a surface form since we can tolerate the violation of the sonority difference in the non-initial position of the semantic unit.

Last, but not least, we can account for the exception of bound nouns with Initial Sound Law as well. Bound nouns need aiding words or phrases to function grammatically as shown in (10) and (12), repeated here as (31) and (32).

- (31) a. *John-un [njən]-ey Mary-lul mann-ass-ta.
 John-TOP year-in Mary-ACC meet-PAST-Decl
- b. John-un 1999 [njən]-ey Mary-lul mann-ass-ta.
 John-TOP 1999 year-in Mary-ACC meet-PAST-Decl
 ‘John met Mary in 1999.’
- (32) a. John-i totwukcil-ul ha-l [li] eps-ta.
 John-NOM theft-ACC do-Adn BN not.exist-Decl
 ‘It is not possible that John stole (something).’
- b. *[li] eps-ta.
 BN not.exist-Decl

This clearly shows that there is a strong relationship between bound nouns and the aiding words or phrases (whether they are specifiers, adjuncts or complements).

Furthermore, in general, nothing can intervene between the preceding words or phrases and bound nouns (i.e., the bound nouns in discussion should be adjacent to the aiding words or phrases).

- (33) a. John-un maywu chwuwessten 1999 [njən]-ey Mary-lul
 John-TOP very cold 1999 year-in Mary-ACC
 mann-ass-ta.
 meet-PAST-Decl
 ‘John met Mary in 1999, which was very cold.’
- b. *John-un 1999 maywu chwuwessten [njən]-ey Mary-lul
 John-TOP 1999 very cold year-in Mary-ACC
 mann-ass-ta.
 meet-PAST-Decl
- (34) a. John-i totwukcil-ul pwunmyenghi ha-l [li]
 John-NOM theft-ACC definitely do-Adn BN
 eps-ta.
 not.exist-Decl
 ‘It is definitely not possible that John stole (something).’
- b. *John-i totwukcil-ul ha-l pwunmyenghi [li]
 John-NOM theft-ACC do-Adn definitely BN
 eps-ta.
 not.exist-Decl

Thus, we find a strong bond between the bound nouns and specifiers/adjuncts/complements.

Also, in a series of studies (Kim, 2016, 2017a, 2017b, 2017c, *inter alia*), it has been claimed that bound nouns in Korean tend to have a functional meaning rather than a lexical one and should be aided by the preceding lexical complements or adjuncts. Note that the meaning of the bound noun *li* [li] is functional (e.g., the epistemic modal meaning—possibility) and that of the bound noun *myen* [njən] is not entirely lexical either (e.g., the classifier function). Therefore, the syntactic requirement that bound nouns need specifiers, adjuncts or complements is also related to the semantic restriction: due to the

functional meanings, bound nouns should be aided by specifiers, adjuncts or complements, which have lexical content.

Based on these pieces of supporting evidence, we assume that bound nouns and their preceding specifiers/adjuncts/complements form one semantic unit. Now, we are equipped to discuss why the target bound nouns do not follow Initial Sound Law in (31b) and (32a).

(35) <1999 njən> in (31b)

/<1999 njən>/	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥3)
a. 1999 njən						* (SUNI:2)
b. 1999 jən				*!		
c. 1999 ljən					*!	** (SUNI:1)
d. 1999 tjən		*!			*	

The preceding phrase *1999* and the bound noun *njən* form one semantic unit. The optimal output (35a) only disobeys the sonority restriction in the non-initial position of the semantic unit, which is very tolerable. On the other hand, (35b) violates Max-IO owing to the deletion of the target nasal sound. (35c) is out because of the manner-of-articulation change and the sonority restriction in the non-initial position of the semantic unit. (35d) cannot be a surface form since it violates the highly-ranked voice constraint (and manner constraint).

(36) <John-i totwukcil-ul ha-l li> in (32a)

/<... li>/	*Complex (onset)	Ident-IO (voice)	CV SDiff (SUI ≥3)	Max-IO	Ident-IO (manner)	CV SDiff (SUNI ≥3)
a. ... li						** (SUNI:1)
b. ... i				*!		
c. ... ni					*!	* (SUNI:2)
d. ... ti		*!			*	

The complement adnominal phrase and the bound noun *li* consist only one semantic unit. We find the deletion of the target lateral sound in (36b) and thus it cannot be chosen as an optimal output. In the case of (36c), we find the manner change (from /l/ to /n/), and the violation of Ident-IO(manner) is crucial. (36d) is clearly ungrammatical, due to the violation of the highly-ranked voice constraint. The candidate (36a) only violates the lowest-ranked constraint related to sonority and thus, it is an optimal output.

4. Implication

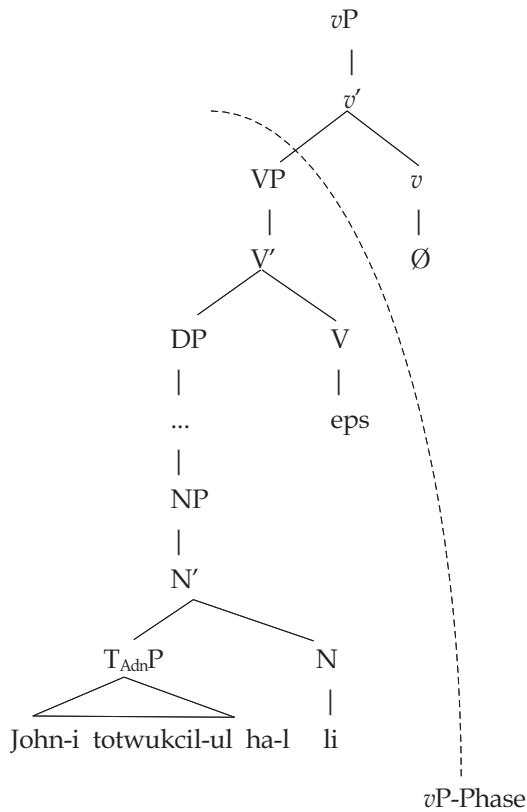
The proposal given implies one important aspect with Syntax, Semantics and Phonology. They are clearly interrelated, and important information sent from one component to another is intact without any loss or more generally syntactic units and semantic/phonological units coincide one another. It is traditionally assumed that what is important in Syntax is also important in Semantics. For example, consider the principle of proximity/distance (Radden & Dirven, 2007, p. 53).

“Conceptual units that belong together conceptually [Semantics] tend to be closely integrated in the structure of language [Syntax]; conversely, conceptual units that do not belong together tend to be distanced in the structure of language.”

Thus, we assume that the syntactic distance equals the semantic integration. In addition to this relationship between Syntax and Semantics, the analysis in this paper expects Phonology to behave the same way.

(37) A Syntactic unit equals a Semantic unit and a Phonological unit.

For example, consider the derivation of (32a).



(38) The syntactic structure of (32a)

Assuming the standard phasehood of vP , the complement of vP will be sent to LF (Semantics) and PF (Phonology). At this point, note that what is being sent to LF and PF forms a unit for each component. The adnominal phrase and the bound noun form a semantic unit for proper interpretation. Also, in Phonology, as argued in this paper, the target phonological behavior (i.e., Initial Sound Law) aims the same unit boundary with Semantics—we find Initial Sound Law only in the initial position of the semantic unit.

5. Conclusion

We have seen that Initial Sound Law in Korean, in fact, targets a semantic unit but

not a word unit as assumed traditionally. As claimed in Oh and Kim (2021), the minimum sonority difference between C and V in the initial position conforms to the general preference of rising sonority from the onset element to the nucleus component. By modifying the word-initial to semantic-unit-initial notion, we can explain several phenomena that are traditionally assumed as exceptions. One interesting characteristic of this proposal is that syntactic units pattern with semantic units and phonological units, which provides a more integrative explanation to interfaces among Syntax, Semantics and Phonology. Thus, we can say that this study has much more explanatory power than Oh and Kim (2021).

On the other hand, this study also has some drawbacks in that data examined are only synchronic, as one anonymous reviewer points out. The reviewer further comments that new words coined in the Internet such as *nyangachi* '(lit.) bully.cat' (which seems to be a word by blending *nyangnyangi* 'cat' + *yangachi* 'bully') cannot be covered since the nasal n is not elided even though the sonority difference in the word-initial position is less than 3. One possible explanation is that if the word-initial nasal is deleted, then what remains is just *yangachi* which becomes homophonous with *yangachi* 'bully': the meaning of *cat* becomes lost. Thus, there appears to be some interaction between the preservation of meaning and the violation of Initial Sound Law. This obviously could be another topic that linguists can focus on, and we leave this matter for future research.

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