Onset Analysis of Korean On-Glides*

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There are two different hypotheses on the location of Korean on-glides with respect to syllable structure. The Onset Hypothesis claims that on-glides are onset segments, while the Nucleus Hypothesis argues that they are nucleus segments. Two sets of data are discussed, and the Onset Hypothesis is argued for in this paper. The first set illustrates four phonological phenomena that support the Onset Hypothesis. The second set, those employed to support the Nucleus Hypothesis, are subjected to reanalysis. Thus, it will be shown that, despite the orthographic representation of glides, the Onset Hypothesis is better motivated in Korean.

1. Introduction

A glide is represented as part of a vowel in the Korean orthographic system. And, traditionally, perhaps because of the way they are represented in orthography, Korean on-glides have been treated as vowels; therefore, a sequence like /ya/ is called a ‘diphthong’ in prescriptive grammar books. With the reemergence of the role of the syllable in phonological description, however, many Korean phonologists have proposed different syllable structures for the description of the Korean syllable, and the status of glides with respect to syllable structure has become one of the interesting issues in Korean phonology.

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B.-G. Lee (1982), S.-C. Ahn (1985) and Gim (1987) propose that the glide is an onset segment, while Kim-Renaud (1977), J.-M. Kim (1986), H.-S. Sohn (1987a, b), H.-Y. Kim (1990), and Y.-S. Kang (1991) argue that the glide is a nucleus segment. Sohn (1987b: 104) sums up the controversy concerning the location of the glide in the syllable by observing that a CGVC sequence can be represented in two different ways as shown in (1), which incorporates Levin’s (1985) view of syllable structure:

(1) Two Different Representations of a Glide

![Diagram showing two different representations of a glide in syllable structure.]

In (1a), the glide is located outside of the nucleus (N), while in (1b) it is represented inside of the nucleus. The structures given in (1) can be translated into McCarthy and Prince’s (1986) type of moraic syllable structure as in (2):

(2) Moraic Representation of a Glide

![Diagram showing moraic representation of a glide.]

Putting aside certain differences between the representations (1) and (2), which are not directly relevant to the discussion in this paper, I will use the syllable structures in (2) throughout this paper. One characteristic of McCarthy and Prince’s (1986) style of moraic representation is that the structure is, in some sense, impoverished. There is no intermediate constituent such as onset, nucleus or coda. I do not think any of these intermediate units have any formal status in phonological theory. However, I will use these terms for the sake of convenience and in the following manner as they apply to Korean:

(3) Terminology

**Onset:** Any segment (or segments) that is placed before a mora in a syllable.

**Nucleus:** Any segment (or segments) dominated by a mora.

**Coda:** Any segment that follows a mora in a syllable.

The aim of this paper is to compare the structures in (2a) and (2b) against various data in Korean to see which representation is more adequate in describing Korean phonology. Sohn (1987a, b) claims that glides should be represented as a part of the nucleus on the basis of phonotactic data and language-game data. For her, (1b) or (2b) is the correct representation. I will call this approach the Nucleus Hypothesis (= NH). H.-S. Sohn (1987b), Kim and Kim (1990) and H.-Y. Kim (1991) present a comprehensive array of data and argue for the NH.

We can make an interesting observation concerning Sohn’s proposal. She argues that long vowels are represented as a vowel linked to two x slots in the surface representation as shown in (4):

![Diagram showing the representation of a long vowel as a vowel linked to two x slots.]

Since the topic of this paper is the structure of onset, I will not be concerned about Hyman’s syllable structure.

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1. There are other types of moraic representation of a syllable, such as in Hayes (1989) or Hyman (1985). (See also Zec 1988.) If we adopt Hyman’s (1985) moraic syllable structure, the controversy over the location of the glide in the syllable structure is trivialized since both the onset and nucleus elements are dominated by a mora as shown below:

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σ
 C G V C
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Since the topic of this paper is the structure of onset, I will not be concerned about Hyman’s syllable structure.
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(4) Sohn's Representation of a Long Vowel

\[ N \]
\[ X \]
\[ X \]

Putting (1b) and (4) together, we come to a conclusion that a glide-long vowel sequence, often derived by the application of glide formation in Korean as in B-G. Lee (1979), or in Han (1990) has to be represented as in (5):

(5) Glide-Long Vowel Sequence

\[ N \]
\[ X \]
\[ X \]
\[ X \]
\[ G \]
\[ V \]

One problematic aspect of the structure in (5) is that Sohn's syllabification algorithm does not allow three x-slots under a nucleus. The inability of representing a glide-long vowel sequence as entirely under the nucleus leads us to reconsider the validity of the Nucleus Hypothesis. Nonetheless, Kim and Kim (1990) and H-Y. Kim (1991) present a comprehensive array of data and argued that glides should be represented within a nucleus except in the Kyung-sang dialect.

However, in this paper, I will make a different claim by arguing that glides should not be represented as part of the nucleus rather they should be represented as part of the onset. This Onset Hypothesis (= OH) is reflected by representation (2a).

Before presenting evidence in support of the Onset Hypothesis, I will introduce the feature matrix that I am going to use in this paper. Basically, I will assume that all the phonological features are monovalent following Y. Lee’s (1991) discussion of features and feature geometry in Korean. Korean is thought to have the eight-vowel system as shown in (6) with feature specifications:

(6) Features and Underspecification of Korean Vowels

<table>
<thead>
<tr>
<th>i</th>
<th>e</th>
<th>æ</th>
<th>ø</th>
<th>a</th>
<th>o</th>
<th>u</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>[open]</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[front]</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[round]</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[RTR]</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The two additional front round vowels [i] and [o] in the Korean vowel inventory are thought to be derived by combining a round glide [w] and front vowels in the post lexical level following C.W. Kim (1968) and Sohn (1987a, b). Looking at the feature combinations given in (6), we can see that there are certain generalizations in the feature combinations, which following Archangeli and Pulleyblank (1991), can be expressed by the following path conditions:

(7) Path Conditions

a. if [RTR], then [open]
b. if [open, round], then [RTR]
c. if [front], then not [RTR]

The organization of this paper is as follows: In section two, I will present Korean data along with their analysis to argue for the Onset Hypothesis. In that section, hiatus resolving, onset simplification, language-game data and phonotactic constraints will be discussed to show that the Onset Hypothesis is strongly supported by the phonology of Korean. In section three, I will re-examine some of the data that are supposed to support the Nucleus Hypothesis such as cluster simplification, the l/r alternation and the onset delinking in reduplication. I will show either that the data do not support the Nucleus Hypothesis or that there are equivalent alternative analyses in the OH frameworks. Section 4 presents a brief conclusion.

2. Onset Hypothesis

In this section, I will introduce arguments from vowel clash, vowel harmony data, onset simplification, (i.e. nucleus degemination), language-game data, and phonotactic constraints that will be shown to support the onset hypothesis for Korean glides.

2.1. Hiatus Resolving

Hiatus, or vowel clash, is strongly avoided in many languages. Translating vowel clash into syllable phonology, we may say that hiatus resolving is the

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2 The symbol + indicates that the feature is present.
process of minimizing onsetless syllables. This is well expressed in Lowenstamm’s (1979: 97) principles of syllabification as given in (8):

(8) Principles of Syllabification
Principle I — minimize the number of syllables
Principle II — minimize the degree of markedness of each syllable

The focus of our discussion is Principle II. Given the fact that V(C) syllables are more marked than CV(C) syllables as observed by Lowenstamm (1979: 62) and Noske (1982: 271), we can understand that hiatus resolving is a way to make the syllables less marked. It is true that Korean has onsetless syllables as shown by the presence of such underived words as /oi/ (cucumber) or /au/ (younger brother). However, when onsetless syllables are encountered in the course of a phonological derivation, certain changes may take place such as consonant insertion, glide formation or vowel deletion.

(9) Resolving Hiatus in Korean
a. Glide Formation:
(Make the first vowel into a glide if it is less sonorous than the second.)
- chin - a → chwa
- mo - a → mwa

b. Vowel Coalescence
- dekte → dekte
- kaiL → kaiL

c. Glide Insertion
- minsu - a ‘vocative’ → minsuya
- pʰae - a → pʰaye

It can be seen from the data that the outcome of both glide formation and glide insertion conform to the principles of syllabification; they can be understood as a result of (8) in that the outcome does not have onsetless, thus more marked, syllables. Such an explanation is possible only when we take the glide to be an onset segment in Korean. Notice that if glides are nucleus segments, the changes are left unexplained, since, then, glide formation or glide insertion would not help to resolve the instances of vowel clash. Consider the schematized glide formation under the Nucleus Hypothesis as given in (10):

(10) Glide Formation in NH

The output of glide formation in (10) creates another onsetless syllable. The NH cannot explain why glide formation would take place in Korean. Further the glide insertion in (5c) is left unexplained. The OH has a simple explanation that glides are inserted to get rid of onsetless syllables in surface representations. Seen from this point, glide insertion makes the output less marked in terms of their syllable structure. The NH has no explanation for glide insertion. It has no motivation under the NH and thus cannot point to the generalization that glides are inserted only between two vowels. Note that under the NH, the output of glide insertion, as is the case in glide formation, is another onsetless syllable. These changes are viewed as very natural given the OH and the syllabification principles in (8).

2.2. Onset Simplification
A glide and vowel sequence is often fused into one segment in Korean, which Sohn (1987a,b) refers to as nucleus degemination. This phenomenon is witnessed in colloquial standard Korean as well as in the Kyungsang (=KS) dialect. Consider the following examples:

(11) Examples of Nucleus Degemination
- p’yam p’tem ‘cheek’
- kya ke ‘chaff’
- pinya pine ‘a stick hairpin’
- myaillli menili ‘a daughter-in-law’
- pyolak pelak ‘thunder’

H-S. Sohn (1987a,b), refuting C-W. Kim’s (1968) metathesis analysis, claims that the process can be viewed as merging two nucleus segments into one as schematically shown in (12):

3 In the KS dialect, nucleus degemination is obligatory, while both forms coexist in Standard Korean.
One interesting observation is that the output of the nucleus degemination is a short vowel, unlike the case of coalescence in which two nucleus segments get together to make one long vowel. Thus Sohn formulates a double delinking rule for the nucleus degemination that involves the deletion of features as well as the deletion of an x-slot. However I argue that the process is actually an onset-simplification process, as schematicized in (13):

(13) Onset Simplification

Though both the Nucleus Degemination analysis and Onset Simplification analysis can successfully account for all the variation in (11), these two analyses make very different predictions about the triggering factor of the phonological change. The Nucleus Degemination analysis says that the presence of the two different elements under a nucleus triggers the process, while the Onset Simplification analysis argues that the preceding consonant is the trigger. There is no example of a Korean word where a word initial GV syllable undergoes the Nucleus Degemination. This is more dramatically shown in the KS dialect, where Onset Simplification is obligatory, as shown in (14):

(14) More Examples of Nucleus Degemination

Examples from the KS dialect clearly support the Onset Simplification analysis by showing that in spite of the obligatory nature of the Nucleus Degemination process in the KS dialect, the word initial GV syllable does not undergo the process and that the optional degemination is not applicable to GV syllables in the Standard dialect. My proposal for the KS dialect is that there is a syllable onset constraint that there must be just one onset consonant in the KS dialect, which I will call the Single Onset Consonant Constraint (SOCC). Onset Simplification, then, can be viewed as a process of making syllables less marked; it is obligatory in the KS dialect and optional in the Standard dialect.

On the other hand, the NH will have to make a certain ad hoc provision that the nucleus degemination is not applicable to onsetless syllables or that glides are syllabified into the onset when it is not preceded by any other consonant in the same syllable and they are syllabified into the nucleus when they follow a consonant within a syllable. No such provision is needed under the Onset Hypothesis to account for the failure of nucleus degemination in glide-initial words. Given these comparisons, we see that the OH is much superior to the NH in explaining the interaction between glides and consonants.

2.3. Language Games

In this subsection, we will consider language games in Korean and will discuss how these data are related to the location of glides in syllable geometry. In Korean, there is an interesting language game that duplicates each syllable with some operations on the duplicated syllables. Following Gim (1987), I will call this CV-insertion language game Pepeli 'speaking impaired' language. First observe the following data:

(15) Pepeli Language Forms

Roughly speaking, the Pepeli language forms are derived from lexical words by adding CV at the end of each vowel segment. I will follow McCarthy and Prince's (1986) syllable-reduplication analysis: A core
syllable is reduplicated after each syllable with coda consonant extrametrical and the phonemic overwriting process will delink onset elements of the reduplicated syllable and link certain specified consonants such as /p/ or /l/. Here is the sample derivation of the language game form of the last word of (15):

(16) Exemplary Derivation of Pepeli Form with man

\[
\begin{array}{cccccccc}
\sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma \\
\mu & \mu & \mu & \mu & \mu & \mu & \mu & \mu \\
\text{s a l a m} & & & & & & & (m)
\end{array}
\]

(phonemic overwriting)

\[
\begin{array}{cccccccc}
\sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma \\
\mu & \mu & \mu & \mu & \mu & \mu & \mu & \mu \\
\text{s a s a s a l a l a l a m} \\
\text{Reduplicated syllables are represented in boldface.)}
\end{array}
\]

\[
\begin{array}{cccccccc}
\sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma & \sigma \\
\mu & \mu & \mu & \mu & \mu & \mu & \mu & \mu \\
\text{s a s a s a l a l a l a m} \\
\text{Coda linking}
\end{array}
\]

Now, suppose the input of the Pepeli language has a glide. We can see that the OH and the NH make different predictions in this case. The OH predicts that the glide will not appear in the reduplicated syllable, since the glide will be delinked, or erased, in the phonemic overwriting process. Onset delinking will delink any onset segment including glides. On the other hand, the NH will predict that the glide will appear in the reduplicated syllable, since glides are not subject to the onset delinking process by virtue of the fact that they are part of the nucleus.

Observe the language-game forms of word that contain glides in (17) (see also Gim 1987, Y.-S. Kang 1991, J.-S. Lee 1992):

(17) Additional Pepeli Language Forms

- hakkyo ‘school’ \(\rightarrow\) ha-pak-kyo-po *ha-pak-kyo-pyo
- yaq kam ‘grandpa’ \(\rightarrow\) ya-paq-ka-pam *ya-paq-ka-pam

5 To be more specific, I will have to say that the round glide has two different forms in Korean orthography. [w] is represented in the orthographic form of /o/, when it is followed by /a/ or /e/; otherwise it is represented in the orthographic form of /ui/.
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(19) **Representation of Glides in Korean Letters**

\[
\begin{array}{c}
\text{O} \quad \text{ŋ} \quad \text{a} \\
\text{o} \quad \text{ŋ} \quad (= \text{waN (past)}) \\
\text{n} \quad \text{n} \quad (= \text{nyan (year)}) \\
\end{array}
\]

(0: no onset)

If a Korean subject who does not know this game is asked to insert a consonant-vowel sequence after each vowel, then chances are that the person, being unable to give the instant output of the language game form, will stick to the graphic forms of Korean letters and will literally draw out the language-game outputs with conscious effort. And in the course of doing this, he or she will simply copy the vowel shape onto the reduplicated syllable. The result is the inadvertent transfer of the entire vowelshape, including glides, hence the appearance of glides in the resultant language output. The point is that, in this type of experiment, what the subjects are doing is the manipulation of the written symbols. They are not dealing with the linguistic units of pronunciation. Seen from this viewpoint, given the orthographic representation of glides, it is quite understandable that some who do not know the language game will produce (18).

One piece of supporting evidence for the observation made herein is the language-game data that I collected from preschool children. I made an informal group contact with seven Korean speaking children, ages between four and seven, who did not yet have full control of Korean orthography. I gave them the exemplary derivations with control words that did not contain glides. When they became comfortable with the language game, I asked 6 I would offer a similar account to the vowel switching language game introduced by Sohn (1987b). Sohn argues that glides are nucleus elements with the following language-game output:

\[
\begin{array}{c}
kalyo 'if' \quad \rightarrow \quad kya\ll \quad *k\llyo \\
ha\ll 'cooling' \quad \rightarrow \quad ha\ll \quad *ha\ll \\
sunyo 'nun' \quad \rightarrow \quad sy\ll \quad *s\llyo \\
\end{array}
\]

As Sohn admits, the vowel-switching game is not a natural-language game. I have found that this is a very difficult game for me and for many other Korean speakers as well. Given the difficulty of the game and the orthographic forms of glides, I would say that what the subjects are operating on in such a language game is written symbols and not speech segments. The language-game data, from this point of view, can be treated as an artifact from the orthographic forms.

7 The control and target words are as follows:

**Control words:**
- salam 'man'
- kunin 'soldier'
- asin 'morning'
- kamca 'potato'
- target words: hakkyo 'school'
- sakwa 'apple'
- yaca 'woman'
- waj 'king'

8 The typical type of mistake was to insert -pa- after every vowel.
We might also say that there is a very strong constraint in a Korean onset cluster under the Onset Hypothesis: The second member of a consonant cluster should be a glide.

H.-S. Sohn (1987a, b) focuses on introducing some phonotactic constraints that hold between glides and vowels (as she terms it, between two nucleus segments). Her observations can be summarized as in (21):

(21) Phonotactic Constraints Between Glides and Vowels
   a. * [+high, -round] [+high, -round] (yi, *yi)
   b. * [+round] [+round] (*wu, *wo)

Now we have the argument from both sides. There are phonotactic constraints between consonants and glides as well as between glides and the following vowels. However, the phonotactic constraints given in (20) and (21) are very different from each other. In the examples given in (20), the constraint disallowing pw, sy while permitting pu, si clearly shows that the glides are different from vowels. Since [w] and [u] as well as [y] and [i] are both supposed to share the same features, the difference should be incorporated by its location. I argue that the phonotactic constraints in (21) is the real evidence for the subsyllabic structure of a syllable.

Turning to (21), we find that we have a [yi] sequence—at least in ideophones—in order to explain the ilkucta → yalkucta alternation (cf. Y.-S. Kim 1988). If we exclude w from the constraints in (21), we see that all of the three remaining impossible combinations (yi, wu, and wo) are sequences of phonetically very similar segments. The occurrence of such sequences (especially yi and wu) are rare cross-linguistically. Ohala and Kawasaki (1984: 122) claim that the combination of these two similar sounds fail acoustically to create 'minimal difference' or 'minimal modulation' and that is why the sequence is universally rare. Therefore the constraint in (21) can be explained by the universal tendency of avoidance of non-optimal sounds. Further we find that not only wu or yi, but also the heterosyllabic uu or ii are rarely found in Korean. I take these observations as relatively strong evidence for the Onset Hypothesis.

3. Reexamining Data Supporting the Nucleus Hypothesis

In this section, we will examine some other data that are supposed to support the NH. We will discuss coda cluster simplification, the l/r alternation, and reduplication data from ideophones. We will show either that these do not constitute a strong argument against the OH or that the data can be reanalyzed under the OH without any additional complication or exception.

3.1. Cluster Simplification

In Korean, only one obstruent is allowed in the onset and one in the coda. Kim and Kim (1990) used cluster simplification to argue for the Nucleus Hypothesis. Let's first briefly review their arguments. Observe the following data from Kim and Kim (1990):

(22) Cluster Simplification
   a. kaps 'price' kaps - i (Nom), but kap-man 'price only'
   b. naks 'spirit' naks - i (Nom), but nak-to 'the soul also'
   c. ilk - 'to read' ilk - ala (Imp), but ilk-ca 'let's read'
   d. calm- 'young' calm - in (adj), but cam-cima 'though young'

(23) Lack of Cluster Simplification
   a. olo-pyo 'this year's crop'
   b. kak-pyo 'each vote'
   c. sil-kwa 'fruit'
   d. cal-myo 'exquisiteness'

According to Kim and Kim's (1990) analysis of (22), one of the first two consonants disappears when they are immediately followed by a third consonant. In (22a) and (22b), the second consonant is deleted, while in (22c) and (22d), the first consonant is deleted. In (22a), when /ps/ is followed by a vowel, a nominative marker in this example, both consonants appear. However, if another consonant, /m/, follows, all of a sudden /s/ disappears. Now the crucial data are given in (23). Here the segment that follows the two consecutive consonants is a glide. If glides are vowels, then we won’t get cluster simplification, just like in the second column of (22). However, if glides are consonants, then we are supposed to find the same cluster-simplification process as in (22). The data (23) show that if the third segment is a glide, no consonants are deleted. Kim and Kim interpret this to mean that glides are not consonants, which in turn mean that glides are not onset elements.

I think the analysis given above presupposes that consonant cluster simplification is a rule that refers to the sequence of consonants. If so, the analysis clearly reflects the drawbacks of a rule approach to consonant-cluster simplification. Also notice that the rule approach cannot say anything about when two consonants are placed at the end of a word. The analysis would say that cluster simplification takes place when two consonants are followed by a third consonant or by a word boundary. In other words, the environment of cluster simplification is {C, #}. 
Kahn (1976) convincingly showed that whenever \( \{C, \#\} \) serves as the environment of a rule application, that rule can be reanalyzed in reference to the syllable structure.

Cluster simplification is not a separate rule but a natural result of the syllabification process. Consider the syllable structure proposed by the OH and the NH in (24):

(24) *Schematic Representation of a Glide in a Syllable*

\[
\begin{align*}
\text{a. Onset Hypothesis} & \quad \text{b. Nucleus Hypothesis} \\
\begin{array}{c}
\text{C} \\
\text{G} \\
\text{V} \\
\text{C}
\end{array} & \quad \begin{array}{c}
\text{C} \\
\text{G} \\
\text{V} \\
\text{C}
\end{array}
\end{align*}
\]

The NH can explain the data neatly with the structure in (24b). According to the NH, only a single consonant is allowed both in the onset and in the coda in Korean. Therefore if there are three consonants in a row, all of them cannot be incorporated into a syllable, and unincorporated consonants are doomed to be erased by the Stray Erasure Convention as in Itô (1986). Since glides are not counted as consonants, the two consonants that precede the glide will be syllabified: the first one will be syllabified as a coda of a syllable and the second consonant will be syllabified as an onset of the next syllable. And, if there are two consonants at the end of a word, one of them will be erased since Korean syllable structure allows no more than one element in the coda.

Notice, however, the OH can equally handle the data. There is a constraint that a second member of an onset is a glide. When three consonants come together, one of them cannot be syllabified, given the syllable structure in (24a). But if the third one is a glide, then the syllable template allows a consonant-glide cluster in the onset and therefore all three can be syllabified, unless, of course, such a sequence is located at the beginning of a word.

As such, both the OH and the NH can explain the cluster simplification. That the NH can explain the data given in (22) and (23) does not mean only the NH can provide a correct account. Therefore, the argument against the OH on the basis of cluster simplification is not strong enough.

A final remark on the onset-consonant cluster is in order: In the literature, there is a generally accepted assumption that clusters are allowed neither in onset nor in coda in Korean (cf. Kim-Renaud 1977, H.-S. Sohn 1987b, and J.-W. Choe 1986). This assumption is generated under the traditional notion that glides are nucleus elements. Under the view that a glide is part of the onset, a glide could be preceded by another consonant in a syllable as the syllable structure (24a) shows. Further, allowing this type of consonant cluster in the onset does not mean that any two consonants can come together in an onset. The second member of the onset cluster should be a glide. This can be easily formalized by positing a Syllable Structure Constraint that disallows the sequence of two consonantal root nodes pre­mor­ni­ca­ly within a syllable.

3.2. \textit{lr} Alternation

In Korean, the \textit{lr} contrast is not phonemic. These two sounds occur in mutually exclusive environments. Traditionally, it is thought that \( [l] \) is the underlying segment and this sound becomes \( [r] \) when it is placed in between two vowels. Kim and Kim (1990) reanalyzed the \textit{lr} alternation in Korean and suggest that the liquid is realized as \( [l] \) in the syllable-coda position and as \( [r] \) when it is placed in the onset position of a syllable. Observe the data from Kim and Kim (1990):

(25) *\textit{lr} Alternation in Korean*

\[
\begin{align*}
\text{a. kil (street)} & \quad \text{kil-to (street also), cf. kil-e \{kire\} 'the street (Loc.)'} \\
\text{tal (moon)} & \quad \text{tal-pic\{moon-light\}, cf. tal-i \{tari\} 'the moon (Nom.)'} \\
\text{pul (fire)} & \quad \text{pulk\{o\}c\{flame\}, cf. pul-\{puril\} 'fire (Acc.)'} \\
\text{b. il-yo-il} & \quad \text{[iryoil], *\{ilyoil\} 'Sunday'} \\
\text{sol-yok} & \quad \text{[saryok], *\{salyok\} 'vindication'} \\
\text{kil-wal} & \quad \text{[kirwal\{writing\}, *\{kawal\} 'writing'}} \\
\text{mil-wal} & \quad \text{[mirwal\{honeymoon\}, *\{milwal\]}
\end{align*}
\]

Kim and Kim (1990) say that the data in (25) argue for the NH. Onsetless syllables are highly marked universally, and glides are syllabified into a nucleus. Therefore whenever the glide is preceded by a consonant, that consonant should be syllabified in the onset position. Their analysis is very simple and consistent. I will not argue that their analysis is wrong in this subsection.

However, I claim that the data in (25) are not incompatible with the OH. It must be made definitely clear that both the Onset Hypothesis and the Nucleus Hypothesis will take the liquid and make it as a part of the onset as the following structure shows:

\[
\begin{align*}
\text{\textit{lr} Alternation in Korean}
\end{align*}
\]
(26) Representation of ‘Sunday’

a. OH Approach

\[ \sigma \sigma \mu \mu \mu i l l o i l \]

b. NH Approach

\[ \sigma \sigma \mu \mu \mu i l l o i l \]

As shown in (26), both approaches observe the Maximal Syllable Onset Principle. An additional observation comes from Kyungsang dialect variation. In the KS dialect, the words in (25b) are pronounced with the [l] sound instead of [r] unlike the prediction made by the NH. In other words, KS dialect speakers’ pronunciation corresponds to the asterisk-marked pronunciation of the words in (25b).

Under the OH, we can see that the explanation is straightforward. Given the Single Onset Consonant Constraint in the KS dialect (cf. discussions in 2.2.), the liquid sound will be syllabified as a coda consonant as shown in the following example:

(27) Syllable Structure of ‘Sunday’ in the KS Dialect

\[ \sigma \sigma \mu \mu \mu i l l o i l \]

We can see that the liquid segment in question cannot become an onset element of the second syllable in (27) because of the Single Onset Consonant Constraint (SOCC) that holds in the KS dialect. The SOCC forces the liquid to be syllabified as a coda of the first syllable as shown in (27). Therefore it is fully predictable that liquid segments which come before glides will be realized as [l] in the KS dialect. Of course, it is correctly predicted that the KS dialect pronunciation of liquids in the words in (25a) are exactly like the standard dialect.

On the other hand, the NH may not successfully handle the KS dialect, without the assumption that glides are onset segments in the KS dialect, but a nucleus segment in the Standard dialect (cf. H.-Y. Kim 1991: 12-13) or that the KS dialect allows and actually prefers onsetless syllables. Neither of the alternatives can be incorporated in the present framework. The overall phonology of the KS dialect and Korean phonology in general for this matter actually argues against the internal onsetless syllable structure.

3.3. Reduplication and Onset Deletion

In Korean, there are many interesting reduplicative ideophones. Consider the following examples:

(28) Reduplicated Ideophones

- hintil - hintil ‘swaying’
- mallag - mallag ‘flabby’
- chullag - chullag ‘overflowing’
- pintun - pintun ‘toasting’

The first and the second parts of the ideophones which are separated by hyphens in the examples are exactly identical to each other. Further, there are some ideophones that seem to show other processes in addition to reduplication. Observe the following data:

(29) Ideophones with an Additional Process

- aki - caki ‘sweet’
- osun- tosun ‘friendly’
- ulkit-pulkit ‘colorful’
- alluk- talluk ‘stained’
- als’onq - tals’onq ‘ambiguous’

Looking at the data, we can see that some process other than simple reduplication operates here. What is interesting to note is that the first part of the words in (29) is vowel initial, while the second part is consonant initial. As a matter of fact, the first part is exactly the same as the second part, except that there is no consonant in the initial position. One way of analyzing these data is to say that the second part is the base form. And these base forms undergo the process of prefixal full reduplication with the onset of the reduplicated forms being lost, perhaps by an ideophone specific rule of onset deletion. I would not try to formalize the process in this paper. All we have to note here is that there is Ω ~ C contrast between the first and the second halves of the ideophones.9

Now suppose that there is an ideophone that contains an initial consonant-glide cluster along with the type of reduplication in (29). Kim and Kim (1990) assume that if the glides are treated as an onset, it will not appear in the ideophone-initial position, and if they are truly nucleus segments, they will not be deleted. Kim and Kim (1990) present the following additional data:

by the process shown in (31) and that nasal will be delinked by the process by a front vowel or a front glide, that liquid will become an alveolar nasal

(30) Additional Reduplicated Ideophones

<table>
<thead>
<tr>
<th>Korean</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>양 - 락</td>
<td>'tasty'</td>
</tr>
<tr>
<td>양 - 락</td>
<td>'vivid'</td>
</tr>
<tr>
<td>요 - 락</td>
<td>'teasing'</td>
</tr>
</tbody>
</table>

Apparently, the glides in the examples in (30) do not seem to be deleted in word-initial position. These data, therefore, may be used to argue for the Nucleus Hypothesis, if they belong to the ideophones in (29). But we have to take into consideration some restricted distribution of the type in (30) along with other phonological processes that can be found in Korean. We have to pay attention to the fact that all the ideophone examples in (30) have front glides [y] in the stem. There is no single example of this type that has a round glide in it. Further, the ideophone stems of this type all begin either with a coronal nasal or with a liquid. We cannot find any example of this type that begins with any other consonant. Since these gaps are so systematic, we will have to reconsider the analysis of the ideophones in (30). What I claim here is that the ideophones in (30) do not belong to the category of ideophones in (29). Rather, they belong to the ideophones in (28).

This claim is supported by other phonological processes that can be found in Korean. In the Korean language, all liquids are alveolar sounds, and those liquids are changed into the homo-organic nasal, [n], on the surface level, when they are placed in word initial position as exemplified in (31):

(31) In Alternation in Word-Initial Position

<table>
<thead>
<tr>
<th>Korean</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>난 - 락</td>
<td>'paradise'</td>
</tr>
<tr>
<td>키 - 락</td>
<td>'labour'</td>
</tr>
<tr>
<td>미 - 락</td>
<td>'tomorrow'</td>
</tr>
<tr>
<td>마 - 락</td>
<td>'a watch tower'</td>
</tr>
<tr>
<td>마 - 락</td>
<td>'a pavilion'</td>
</tr>
</tbody>
</table>

Another relevant phonological process that we have to note here is the alveolar nasal deletion phenomena in Korean. When [n] is placed in word initial position and is followed by a front vowel or a front glide, they do not appear in the surface forms. The relevant examples are given in (30):

(32) Alveolar Nasal Deletion in Korean

<table>
<thead>
<tr>
<th>Korean</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>수 - 락</td>
<td>'woman'</td>
</tr>
<tr>
<td>마 - 락</td>
<td>'urethra'</td>
</tr>
<tr>
<td>시 - 락</td>
<td>'year end'</td>
</tr>
</tbody>
</table>

Now, if the liquid is placed in the word initial position and is followed by a front vowel or a front glide, that liquid will become an alveolar nasal by the process shown in (31) and that nasal will be delinked by the process which is responsible for the alternation in (32). Therefore a liquid sound or an alveolar nasal will not appear in word-initial position before a front glide in the surface representation of any Korean word.

With these observations, let us reconsider the data given in (30). All the examples in (30) have either liquids or nasals, and they are followed by front glides. We do not have a single ideophone of this type, which has a consonant other than a liquid or an alveolar nasal. Given such restrictions, we may say that the deletion of liquids or alveolar nasals may not be the result of the ideophone specific onset deletion process. The examples in (30), therefore, can be reanalyzed, as full reduplication like those in (28), but they additionally undergo liquid to nasal change along with nasal deletion in word initial position.

As such, if we take into consideration other phonological processes in Korean, the examples of ideophones in (30) can be explained naturally within the Onset Hypothesis. These examples thus do not exclusively support the Nucleus Hypothesis.

4. Conclusion

In this paper, I have discussed two different hypotheses on the location of the prevocalic glide in Korean syllable structure: the Onset Hypothesis and the Nucleus Hypothesis. The Onset Hypothesis claims that glides should be represented as onset segments in the syllable structure, while the Nucleus Hypothesis argues that glides should be represented as part of the nucleus.

In this paper, we discussed two different sets of data and argued for the Onset Hypothesis. The first set of data consisted of four phonological phenomena that render relatively strong support for the Onset Hypothesis. The second set of data were those that have been used to support the Nucleus Hypothesis and it was shown that they can either be reanalyzed within the Onset Hypothesis or that they may not actually support the Nucleus Hypothesis.

The first set of data include vowel-clash resolving, onset simplification, language games and phonotactic constraints in Korean. First we observed that the onsetless syllables are eliminated by glide formation or glide insertion. If the glides are nucleus segments, then the hiatus resolving should be interpreted anew since inserting a glide or making a vowel into a glide does not help to get rid of the onsetless syllables.

The Single Onset Constraint with respect to the KS dialect was motivated in this paper, and we saw that the constraint can successfully explain the difference between glide initial syllables and consonant initial syllables with respect to the onset simplification. The Onset Hypothesis can successfully explain the obligatory nature of the onset simplification in the KS dialect as well as the lack of so called nucleus degemination in glide initial syllables in both the KS dialect and the Standard dialect.

The CV insertion language game provides another type supporting
are necessarily realized as incorporation across the word boundary for glide initial morphemes in the better handled with the OH. Further the failure of the optional onset before glides within a syllable. The syllable template given in this paper allows for a consonant plus glide cluster in the onset.

It is placed between a vowel. An interesting observation here is that liquids sound is realized as [r] in between two vowels, but it is realized as [l] when it is placed between a vowel. An interesting observation here is that liquids are necessarily realized as [l] in the KS dialect when they come between a vowel and a glide, and that they remain as [l] before a glide across a word boundary. This simply means that the glides are syllabified into onset and a glide are genuine subsyllabic constraints.

In addition, the data usually quoted in the literature to support the Nucleus Hypothesis were re-examined. Consonant-cluster simplification does not support the Nucleus Hypothesis. This phonological phenomenon can be perfectly reanalyzable with the Onset Hypothesis. That glides are onset segments does not mean that there cannot be any other consonant before glides within a syllable. The syllable template given in this paper allows for a consonant plus glide cluster in the onset.

Further, the l/r alternation in the KS dialect in connection with the Standard dialect was discussed. In morpheme internal position, the liquid sound is realized as [r] in between two vowels, but it is realized as [l] when it is placed between a vowel. An interesting observation here is that liquids are necessarily realized as [l] in the KS dialect when they come between a vowel and a glide, and that they remain as [l] before a glide across a word boundary. This simply means that the glides are syllabified into onset and that in the KS dialect the onset is restricted to one member. These data are better handled with the OH. Further the failure of the optional onset incorporation across the word boundary for glide initial morphemes in the standard dialect clearly reflects that glides are different from vowels in their behavior with respect to the l/r alternation.

Finally, an ideophone-specific onset delinking phenomenon was considered. Some ideophones that contain glides apparently do not undergo an onset-deletion process. This was taken by Kim and Kim (1990) as a crucial piece of evidence that glides are not part of the onset. However, in this paper, it has been shown that such a conclusion was due to the misanalysis of the given data. Taking other relevant phonological processes in Korean into account, we concluded that those ideophones do not go through the onset deletion process, but that the deletion is due to the nasal deletion rule that is also witnessed outside of ideophones.

The discussion in this paper clearly shows that the Onset Hypothesis is better motivated than the Nucleus Hypothesis. In spite of the traditional view influenced by the orthographic representation that glides are part of the nucleus, the Nucleus Hypothesis is not supported by the facts of Korean phonology.

References


