Do People Pronounce Words in the Same Way?  
The Applicability of Phonological Rules in Reading Hangul Words  
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Abstract  
In the present study we investigated how well phonological rules are applied to when people pronounce words written in Hangul. The results showed that there were differences among the rules in their applicability, even though using the rules was obligatory in principle. In addition, there was a hint for the correlation between the rule applicability and word frequency, with the rules applied better for the words with higher frequency.

Introduction  
Hangul (Korean writing system) is composed of alphabetic letters (consonant and vowel letters) but is also characterized by its syllabic structure into which the letters are combined. The letters are packed into syllabic blocks (see Figure 1). A syllable is usually composed of 3 letters: a consonant called the initial (syllable onset, blank in Figure 1), a vowel called the medial (syllable nucleus, solid in Figure 1), and, optionally, a consonant at the end of a syllable, called the final (syllable coda, dot in Figure 1).1

Figure 1: The Word Hangul written in Hangul

In Hangul, a grapheme tends to correspond regularly to a phoneme (e.g. In Figure 1, ‘ㅎ’ represents /h/ sound, ‘ㅏ’ represents /a/, ‘ㄴ’ represents /n/, so ‘한’ is pronounced [han]). Since grapheme-to-phoneme correspondence is rather regular in Hangul, phonological changes are more likely to occur across a syllabic boundary rather than within a syllable: that is, when a final consonant of the first syllable meets an initial consonant of the second syllable, phonological changes often occur due to the phonological constraints between the two sounds. For example, when the first syllable of a two-syllable word is ‘탈[탈]’ and the second syllable is ‘락[라]’, the word is pronounced as ‘탈락[탈라](means omission)’ without any phonological change. However, when the syllable ‘단[탄]’ precedes the syllable ‘학[라]’, the two-syllable word ‘단락(means paragraph)’ is pronounced as ‘달락[탈락]’ and not ‘단락[탄락]’ due to the phonological rule regulating the two consonants ‘ㄴ’(/n/) and ‘ㄹ’(/l/) across the syllabic boundary. Thus ‘달락’ is a non-word homophone of the word ‘단락’.

Phonological changes such as occurred in ‘단락’ are strictly regulated by the phonological rules. So these rules should be applied to without exception. However, recent studies in Hangul suggest that there may be differences in the applicability of these rules (Yi, 1996; Lee and Kim, 2003).

It is important to specify the phonological representations that people produce when they encounter words written in Hangul. In this study we examined the applicability of the eight so-called obligatory phonological rules that are most frequently used in Hangul.

Method  
Participants. Two hundred and nine undergraduate students at Ewha Womans University participated in the experiment for course credit.

Materials. We selected the most frequent eight phonological rules from Lee (1990). For each of the rules, 40 two-syllable noun words were assigned (a total of 320 words). The examples of the materials are presented in Table 1.

Procedures. Participants were asked to transcribe 320 words after they pronounced the words. A total of thirty-five sessions were conducted, and the number of participants didn’t exceed 6 for each session. The order of words was randomized for each session to prevent response bias.

1 Consonant cluster is often placed to the initial or the final. When a syllable has no actual initial consonant, the null initial ‘○’ is used as a placeholder.

2 [θ] is an aspirated sound as the ‘t’ in ‘tea’, and [t] is an unaspirated sound similar to ‘t’ in ‘stop’, or similar to ‘d’ but unvoiced. The diacritic of [θ] stands for aspiration in the International Phonetic Alphabet.
Table 1: The eight phonological rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>No</th>
<th>Explanation</th>
<th>Example</th>
<th>freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensification</td>
<td>1</td>
<td>An obstruent onset after an obstruent coda is tensified.</td>
<td>악보→악뽀 /ak-po/ → [ak-p*o]</td>
<td>416 (8-2535)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>An onset /d, s, j/ after /l/ is tensified.</td>
<td>갈등→갈 Lester /kal-t<em>ʊŋ/ → [kal-t</em>ʊŋ]</td>
<td>419 (8-2941)</td>
</tr>
<tr>
<td>Liaison</td>
<td>3</td>
<td>A coda before a vowel-initial syllable is resyllabified as the onset of the next.</td>
<td>높이→노피 /noph-i/ → [no-phi]</td>
<td>424 (7-2840)</td>
</tr>
<tr>
<td>Nasalization</td>
<td>4</td>
<td>An obstruent before onset nasal is nasalized.</td>
<td>국민→궁민 /kuk-min/ →[kʊŋ-min]</td>
<td>415 (7-4815)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>A liquid after nasal coda is nasalized.</td>
<td>심리→심니 /sim-li/ → [sim-ni]</td>
<td>422 (8-4428)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>A liquid after a nasalized obstruent coda is nasalized.</td>
<td>독립→동닙 /tok-lip/ → [toŋ-nip]</td>
<td>358 (7-2860)</td>
</tr>
<tr>
<td>Aspiration</td>
<td>7</td>
<td>An obstruent adjacent to /h/ is aspirated.</td>
<td>법학→버팍 /pʌp-hak/ → [pʌ-phak]</td>
<td>421 (8-3886)</td>
</tr>
<tr>
<td>Lateralization</td>
<td>8</td>
<td>/n/ before or after liquid is lateralized.</td>
<td>칼날→칼랄 /kɔl-nal/ → [kɔl-lal]</td>
<td>421 (9-2806)</td>
</tr>
</tbody>
</table>

Results

Figure 2 presents the mean application rates of the 8 phonological rules. There was a significant difference among the 8 rules \(F(7, 312) = 166.94, p < 0.001\).

Conclusion

The present results indicate that people’s phonological representations for the words written in Hangul may be more diverse than expected by the phonological rules. The easiness of applying the rules may be influenced by the kind of the rules and the frequency of the words. Our data can provide a helpful pool of stimuli for future studies on phonological processing in reading Hangul.

References

