Visibility of Covert Voicing in Serialism

Keywords: complex compounds, covert voicing, cycle, serialization

A lingering issue in Japanese phonology is the cyclic behavior of Japanese Rendaku in complex compounds. In spite of earlier studies (Otsu 1980; Ito & Mester 1986, 2003), it has not received a satisfactory account. I argue that the interplay of covert voicing and serialization explains the cyclic effect. My analysis is framed in LP-OT (Kiparsky 2000).

Rendaku voices the initial consonant of the righthand head member of a compound, as in (1a). This voicing is blocked if the head contains a lexical voiced obstruent, as in (1b).

(1) a. First Second Compounds Gloss
iro kami iro-gami colored paper
yama tera yama-dera mountain temple
ao sora ao-zora blue sky
b. kami kuzu kami-kuzu paper waste
hana taba hana-taba bouquet
aka sabi aka-sabi red rust

Complex compounds exhibit a contrast like (2a) and (2b). They differ in the (non-)occurrence of Rendaku in /sakura/. Of our interest is (2b) with right-branching structure. In C₁, /sakura/ is the left member, so it is not voiced. The question is why Rendaku fails to apply to [sakuramaturi] at the level of C₂, [sakuramaturi] has no voiced obstruent and is the head in C₂.

(2) a. C₂
    C₁
  nise zakura maturi  b. C₂
    C₁
  nise sakura maturi

‘festival with fake cherry blossoms’  ‘fake cherry blossom festival’

Gloss: /nise/ ‘fake’ /sakura/ ‘cherry blossom’ /maturi/ ‘festival’

Ito & Mester (2003) take a parallel OT approach to the contrast of (2a) and (2b). Their analysis is crucially based on the observation that left-branching compounds comprise one PrWd whereas certain right-branching compounds consist of two PrWds. However, (2a) and (2b) (and countless analogous pairs) comprise one PrWd. Ito & Mester’s analysis is built on misled data description.

I propose a derivational analysis, assuming LP-OT. Starting with head insertion, compounding and phonology proceed alternately, as in (3).

(3) Cycle 1: Head insertion  ➔ Phonology
Cycle 2: C₁ compounding  ➔ Phonology
Cycle 3: C₂ compounding  ➔ Phonology

Relevant constraints are given in (4). π denotes a linking [voi] morpheme added at the juncture of compounded words (Ito & Mester 1986, 2003).

(4) OCP: No π-bearer cooccurs with another or a voiced obstruent within a head.
REALIZE-π: The head must realize π.
IDENT-IO[voi]: Input-output correspondents agree in voicing.
In (2b), /maturi/ is inserted in Cycle 1. π is not added, so faithful [maturi] emerges. In Cycle 2, /sakura/ and [maturi] are combined, accompanied by π insertion. The phonological competition is illustrated in (5), where covert realization of π is indicated in capitalized boldface. (5) shows that REALIZE-π compels covert voicing of the head-initial nasal. In Cycle 3, /nise/ is attached before [sakura-Maturi]. (6) demonstrates that the candidate with Rendaku fatally violates the OCP due to two exponents of π in the head. The non-occurrence of Rendaku in (1b) reveals that π-bearing segments count as segments whose cooccurrence violates the OCP.

(5)

<table>
<thead>
<tr>
<th>/sakura-π-maturi/</th>
<th>OCP</th>
<th>REALIZE-π</th>
<th>IDENT-IO[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. sakura-maturi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. sakura-Maturi</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

(6)

<table>
<thead>
<tr>
<th>/nise-π-sakuraMaturi/</th>
<th>OCP</th>
<th>REALIZE-π</th>
<th>IDENT-IO[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nise-sakuraMaturi</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. nise-zakuraMaturi</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

In (2a), /sakura/ surfaces faithfully in Cycle 1. In Cycle 2, /nise/ and [sakura] are compounded, and [nise-zakura] is generated, as in (7).

(7)

<table>
<thead>
<tr>
<th>/nise-π-sakura/</th>
<th>OCP</th>
<th>REALIZE-π</th>
<th>IDENT-IO[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nise-sakura</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. nise-zakura</td>
<td></td>
<td></td>
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</tbody>
</table>

Thus, covert voicing plays a pivotal role in explaining the contrast of /sakura/ in (2a) and (2b). Covert voicing is essential since uncompounded lexical words and Rendaku-immune compounds would be indistinguishable otherwise.

An analysis with OO-correspondence is a potential alternative. In (2b), the output of Cycle 2 will be [sakura-maturi] unless covert voicing is assumed. Assuming IDENT-OO[voi] => REALIZE-π, the lack of Rendaku in /sakura/ is analyzed as in (9). However, this analysis incorrectly predicts that /sakura/ surfaces faithfully in (2a). In Cycle 2, [sakura] emitted in Cycle 1 becomes the base referred to by IDENT-OO[voi].

(9)

<table>
<thead>
<tr>
<th>/nise-π-sakuramaturi/ Base: [sakuramaturi]</th>
<th>IDENTOO-[voi]</th>
<th>REALIZE-π</th>
<th>IDENT-IO[voi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nise-[sakuramaturi]</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. nise-[zakuramaturi]</td>
<td>*!</td>
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<td></td>
</tr>
</tbody>
</table>

Wolf (2008) proposes interleaving of phonology and morphology in OT-CC (McCarthy 2007), viewing a morphological process as a gradual step. This idea is unsuccessful here. For this theory to succeed, there must be constraint X that favors compounding. If X dominates REALIZE-π, phonology plays no role until an entire compound is constructed. In this case, the cyclic effect is unexplained. If REALIZE-π outranks X, complex compounding is impossible. In (2b), the output of Cycle 2 covertly satisfies REALIZE-π. C₂ compounding adds another π, and the result of C₂ formation decreases phonological harmony by violating REALIZE-π.

In sum, the combination of serialism and covert voicing explains the contrast of (2a) and (2b).

(748 words)