# Japanese verbal conjugation and the theory of underspecification

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# Japanese Verbal Conjugation and the Theory of Underspecification

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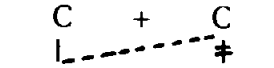
In this joint research we discussed the well-known phenomenon called *Onbin* observed in the past and the gerund forms of Japanese consonant-final verbs. See the examples below:

(1)

| stem | indicative | past |
|---|---|---|
| kar- 'cut' | kar-u | kat-ta |
| kaw- 'buy' | ka-u | kat-ta |
| kat- 'win' | kat-u | kat-ta |
| sin- 'die' | sin-u | sin-da |
| yom- 'read' | yom-u | yon-da |
| tob- 'fly' | tob-u | ton-da |
| kak- 'write' | kak-u | kai-ta |
| kag- 'sniff' | kag-u | kai-da |
| kas- 'lend' | kas-u | kas-i-ta |

Notice that all stems but *kat-* include some alternations. We propose the following rules to accommodate these alternations:

(2) Voicing Spread (VS)




(3) Velar Vocalization (VV)

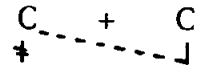
$k, g \rightarrow i \,/\, \_\_ + C$

(4) V-Epenthesis (Ep)

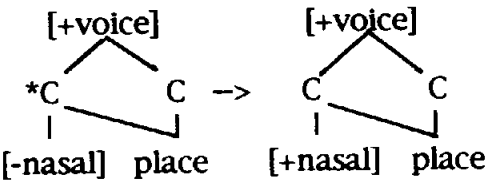
$\phi \rightarrow V \,/\, C \_\_ + C$

[+continuant]

(5) Gemination (Gem)

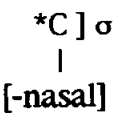


(6) Coda Nasalization (CN)




Note that VV, Ep, Gem, and CN are rules derived from the general Coda Condition in Japanese.

(7) Coda Condition (CC; cf. Ito (1986))




The common way to eliminate violations of this condition is Gem, while velars and sonorants have peculiar ways; i.e. VV and Ep respectively. VS is a rule that voices the suffix initial consonant.

Now let us see how these rules work to produce the expected forms.

| (8) | input | VS | CC(=VV, Ep, Gem, and CN) |
|---|---|---|---|
| | kar-ta | | kat-ta (Gem) |
| | kap-ta[1] | | kat-ta (Gem) |
| | kat-ta | | |
| | sin-ta | sin-da | |
| | yom-ta | yon-da | |
| | tob-ta | tob-da | tod-da –> ton-da (Gem + CN) |
| | kak-ta | | kai-ta (VV) |
| | kag-ta | kag-da | kai-da (VV) |
| | kas-ta | | kas-i-ta (Ep) |

Note that both Gem and CN apply to the *b*-ending stem, since voiced geminates are not allowed if they are not nasals.

To predict the correct output form, we must assume the Underspecification theory, since it seems that VS does not apply to *r*-ending stem; that is, *r* is not assigned the feature [+voice] before VS. But *m* and *n* should be specified for [+voice] because they cause VS.

However, a problem arises when we are faced with the sequential voicing phenomenon observed in compounds, which is known as

*Rendaku.* As Ito and Mester (1986) point out, sequential voicing occur only when consonants in the right word of the compound do not contain the feature [+voice]. As we see below, it does not apply when the right word has *g* , while it applies in the case of *n* and *r*:

| | | | | |
|---|---|---|---|---|
| (9) | nuri + kasa | --> | nurigasa | 'lacquered umbrella' |
| | oo + tokage | --> | *oodokage | 'big lizard' |
| | mizu + hana | --> | mizubana | 'running nose' |
| | yama + tera | --> | yamadera | 'mountain temple' |

It is strange that *n* does not have [+voice] in the later compounding level, while it has the feature in the earlier conjugation level.

We explain this contradiction as follows. Both *n* and *r* do not have [+voice] underlyingly. *n* receives the feature at the end of level 1, while *r* does not because of its least-marked characteristic (cf. Mester and Ito (1989) and de Chene (1987)). The *Onbin* rules apply at level 2; thus *n* causes VS but *r* does not. At level 3, which is a cyclic compounding level, features assigned at earlier levels by default rules are erased by the Default Erasure Convention (10); thus both *n* and *r* do not undergo sequential voicing.

(10) Default Erasure Convention (DEC)
Feature values assigned by default rule are erased at every cyclic level.

| | | |
|---|---|---|
| (11) | level 1 | specifications for [voice] except for *r* |
| | level 2 | *onbin* |
| | level 3 | DEC |
| | | sequential voicing |

Note that the effect of DEC is vacuous at level 1, another cyclic level.

In sum, we have proposed a natural analysis for the *Onbin* phenomenon, whose rules are mainly triggered by the Coda Condition. No previous analyses were successful because they postulated so many ad hoc rules (cf. Davis and Tsujimura (1992)). Furthermore, we have solved the ordering paradox concerning voicing specifications by assuming the DEC.

## Notes

[1] [w] is assumed to be underlyingly /p/ (cf. McCawley (1968)).

## References

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