

PHONOLOGICAL ANALYSIS OF JAPANESE VERBS*

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Introduction

This paper tries to give a phonological analysis of Japanese regular verbs. The two irregular verbs *kuru* 'come' and *suru* 'do' are not included here. For ease of exposition, rules of accentuation are separated from the rest.

1. Phonological rules

The following eight rules are required to explain the morphological alternation of Japanese verbs.

- R1. $V \rightarrow \emptyset / V + \underline{\quad}$
- R2. $\{t, r, w\} \rightarrow Q / \underline{\quad} + t$
 where: Q is a syllabic obstruent [+syllabic, -sonorant].
- R3. $t \rightarrow d / [C, +voiced] + \underline{\quad}$
- R4. $\emptyset \rightarrow i / s \underline{\quad} + t$
- R5. $\{n, m, b\} \rightarrow N / \underline{\quad} + \{t, d\}$
 where: N is a syllabic nasal [+syllabic, +nasal].
- R6. $\{k, g\} \rightarrow i / \underline{\quad} + \{t, d\}$
- R7. $C \rightarrow \emptyset / [-syllabic] + \underline{\quad}$

These rules are ordered extrinsically as follows.

- R2 > R3, R3 > R5, R3 > R6, R4 > R7, R5 > R7,
 R6 > R7, (R2 > R7), (R3 > R7)

“R2 > R3” means that R3 cannot apply to any form that meets the conditions of R2. This type of rule ordering (i.e. Priority Rule Ordering) is transitive, and the rule orders in parentheses in the above are predicatable from the rest because of this transitivity. The following rule R8 is a general rule that applies to any form in the language that meets the conditions.

R8. Syllabic consonant rule

$$\begin{array}{ccc} \left[\begin{array}{l} + \text{syllabic} \\ + \text{consonantal} \\ \alpha \text{ nasal} \end{array} \right] & \text{C} & \rightarrow & \left[\begin{array}{l} \phantom{+ \text{syllabic}} \\ + \text{syllabic} \\ \alpha \text{ nasal} \end{array} \right] & 2 \\ 1 & & & & \end{array}$$

It assimilates syllabic consonants to the following consonants. It applies to the output of the above rules R1, ..., R7. Examples (1)-(15) will illustrate how these rules and rule orders work. The first line in each example is the underlying form.

(1) *tabe anai* / R1

R1 *tabe nai*

‘not eat’

(2) *tabe azuni* / R1

R1 *tabe zuni*

‘without eating’

(3) *tabe itai* / R1

R1 *tabe tai*

‘want to eat’

(4) *kar ta* / R2, R3, R7

R2 *kaQ ta* / R8

R8 *kaɿ ta*

‘mowed’

tabe anai of (1) is the underlying form, and it meets the conditions of R1. R1 deletes the vowel *a*, and we get the surface form *tabe nai* ‘not eat’. *kar* ‘mow’ of (4) is the underlying form of the verb, and *ta* that follows it is the underlying form of the past tense marker. Sequence *kar ta* ‘mowed’ meets the conditions of the rules R2, R3, and R7. Because of the rule orders given above, only R2 can apply to this

form. The output *kaQ ta* now meets the conditions of R8, and it produces the surface form [kaṭta], in which [ṭ] is syllabic.

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|------------------------------|-------------------------------|
| (5) kaw temi ta / R2, R3, R7 | (6) kog tara / R3, R6, R7 |
| R2 kaQ temi ta / R8 | R3 kog dara / R6, R7 |
| R8 kaṭ temi ta | R6 koi dara |
| ‘tried buying it’ | ‘if (someone) rowed (it)’ |
| (7) kog azuni | (8) sas ta / R4, R7 |
| ‘without rowing’ | R4 sasi ta |
| | saši ta |
| | ‘thrust’ |
| (9) sas anai | |
| ‘do not thrust’ | |
| (10) yom ta / R3, R5, R7 | (11) yob temi ta / R3, R5, R7 |
| R3 yom da / R5, R7 | R3 yob demi ta / R5, R7 |
| R5 yoN da / R8 | R5 yoN demi ta / R8 |
| R8 yoṅ da | R8 yoṅ demi ta |
| ‘have read’ | ‘tried calling (him)’ |
| (12) kak tara / R6, R7 | (13) kak azuni |
| R6 kai tara | ‘without writing’ |
| ‘if (someone) wrote (it)’ | |
| (14) kak ru / R7 | (15) kak reba / R7 |
| R7 kak u | R7 kak eba |
| ‘write’ | ‘if (someone) writes (it)’ |

[ṅ] of (10) and (11) is a dental syllabic nasal.

2. Accentuation of Japanese verbs

Verbs in the lexicon are marked either as [+Accented] or as [-Accented]. [+Accented] verbs undergo rule A1, and if it is a consonant verb, the last vowel is accented, and if it is a vowel-final verb, the last vowel but one is accented as in (1).

- A1. $V \rightarrow [+ \text{Accented}] / [X \text{ ____ } (C) (V)]_{\text{Verb, +Accented}}$
 (1) $mi\bar{\text{r}}\text{-ta}$ ‘saw’ $ku\bar{\text{r}}i\text{-ta}$ ‘regretted’
 $odoro\bar{\text{r}}k\text{-ta}$ ‘was surprised’ $ha\bar{\text{r}}w\text{-ta}$ ‘crawled’
 $atu\bar{\text{r}}me\text{-ta}$ ‘collected’

The accented vowel becomes the accent nucleus of the word. In (1), the accent nucleus is marked by symbol “ $\bar{\text{r}}$ ”. If the second vowel of a double vowel has the accent, rule A2 will move it to the first vowel as in (2), (3).

- A2. The accent nucleus on the second vowel of a double vowel like *ai*, *ae*, etc. is moved to the first vowel.

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|-----|-----------------------------------|-----|-----------------------------------|
| (2) | $kae\bar{\text{r}}\text{-ru}$ | (3) | $mai\bar{\text{r}}\text{-ta}$ |
| | A2 $ka\bar{\text{r}}er\text{-ru}$ | | A2 $ma\bar{\text{r}}iQ\text{-ta}$ |
| | A5 $kaer\text{-ru}$ | | ‘come, be beaten’ |
| | A2 $ka\bar{\text{r}}er\text{-u}$ | | |
| | ‘return’ | | |

Present tense marker $\bar{\text{r}}ru$ is “pre-accenting”, i.e. puts the accent on the preceding vowel. Notice that in example (2), A2 is applied for the second time to the output of A5 (which is discussed below).

A3 is a major rule, that is, it applies to any form that meets the conditions unless it is marked [–A3]

- A3. Deaccent the suffix if the stem is unaccented. (Major rule)

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|-----|-------------------------------------|-----|------------------------------------|
| (4) | $ki\bar{\text{r}}\text{-ru}$ | (5) | $tomar\bar{\text{r}}\text{-ru}$ |
| | A3 $ki\text{-ru}$ | | A3 $tomar\text{-u}$ |
| | ‘wear’ | | ‘stop’ |
| (6) | $hatarak\text{-a}\bar{\text{r}}nai$ | (7) | $hatarak\text{-it}\bar{\text{r}}i$ |
| | A3 $hatarak\text{-anai}$ | | A3 $hatarak\text{-itai}$ |
| | ‘not work’ | | ‘want to work’ |

[−A3] suffixes: *māi*, *yōo*, *tēmo*, *tāra*, *tāri*, *īmos*, etc.

(8)-(10) are examples of [−A3] suffixes.

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|-----|-------------------|-----|--------------------|
| (8) | hatarak-ru-māi | (9) | narabe-īmos-ta |
| | A3 hatarak-u-māi | | R1 narabe-mosi-ta |
| | A3 *hatarak-u-mai | | A3 *narabe-mosi-ta |
| | ‘will not work’ | | ‘also arranged’ |

- (10) hatarak-yōo
 R7 hatarak-ōo
 ‘will work’

In (8)-(10), the second line is the correct form. *ru* of (8) must undergo A3, but *māi* should not undergo it because it is a [−A3] suffix.

A4 is a minor rule and applies only when the suffix has feature [+A4].

A4. Deaccent the suffix if the stem is accented. (Minor rule)

Some of the [−A3] suffixes are also [+A4] suffixes. For example, *tēmo*, *tāra*, *īmos*, *tāri*, etc. are [−A3, +A4], but they need not be marked as [−A3] in the lexicon because of Redundancy Rule RR1.

RR1. [+A4] → [−A3]

RR1 says that all [+A4] suffixes are also [−A3] suffixes. *yōo*, *māi*, etc. are [−A3], but not [+A4]. (11)-(13) are examples of [+A4] suffixes.

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|------|-----------------------------|------|--------------------------------|
| (11) | odorōk-tēmo | (12) | atūme-tāra |
| | A4 odoroī-temo | | A4 atūme-tara |
| | ‘even if (he) is surprised’ | | ‘if (he) has collected (them)’ |
- (13) odorok-īmos-ta
 A4 odorok-imosi-ta
 ‘was also surprised’

A5 is a major rule that deaccent the stem before an accented suffix as in (14)-(16).

A5. Deaccent the stem if the suffix is accented. (Major rule)

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| <p>(14) $ta\bar{\ }be\bar{\ }ru$
 A5 $tabe\bar{\ }ru$
 ‘eat’</p> | <p>(15) $ta\bar{\ }be\text{-}taga\bar{\ }r\text{-}ta$
 A5 $tabe\text{-}taga\bar{\ }Q\text{-}ta$
 ‘wanted to eat’</p> |
| <p>(16) $atu\bar{\ }me\text{-}ra\bar{\ }re\text{-}ta$
 A5 $atume\text{-}ra\bar{\ }re\text{-}ta$
 ‘were collected’</p> | |

Examples like (17), (18) show that rule orders R01 and R02 are needed to avoid incorrect accentuation.¹

R01. A3 \rightarrow A5

R02. A4 $>$ A5

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|---|--|
| <p>(17) $ta\bar{\ }be\text{-}ra\bar{\ }re\text{-}ta / A5$
 A5 $tabe\text{-}ra\bar{\ }re\text{-}ta / A3$
 A3 $*tabe\text{-}rare\text{-}ta$
 ‘was eaten’</p> | <p>(18) $ta\bar{\ }be\text{-}te\bar{\ }mo / A4, A5$
 A4 $ta\bar{\ }be\text{-}temo$

 A5 $*tabe\text{-}te\bar{\ }mo$
 ‘even if (he) eats (it)’</p> |
|---|--|

“A3 \rightarrow A5” is a precedence rule order. It means that forms that have undergone A5 must not undergo A3. “A4 $>$ A5” is a priority rule order, and means that forms that meet the conditions of A4 must not undergo A5. In (17), the output of A5 meets the conditions of A3, but application of A3 violates R01 and results in an unacceptable form. $ta\bar{\ }be\text{-}te\bar{\ }mo$ of (18) meets the conditions of both A4 and A5 ($te\bar{\ }mo$ is a [+A4] suffix), but R02 requires it to undergo A4 rather than A5.

These rules of accentuation apply cyclically from the most deeply embedded structure step by step to larger structures as in (19)-(23).

(19) [[tābe-rāre]-tagār]-tēmo
 [-A3] [+A4]

A5 [tabe-rāre-tagar]-tēmo

A5 tabe-rare-tagar-tēmo

A4 tabe-rare-tagar^Q-temo

‘even if (he) wants to be eaten’

(20) [[hatarak-itagar]-ru]-māi
 [-A3] [-A3]

[hatarak-itagar-ru]-māi

A5 hatarak-itagar-ru-māi

A5 hatarak-itagar-u-māi

‘will not want to work’

(21) [atūme-ta]-dake

atūme-ta-dake²

‘as much as (he) has collected’

(22) [[[tābe-rāre]-imās]-ēn]-kāra

A5 [[tabe-rāre-imas]-en]-kara

A5 [tabe-rare-mas-en]-kara

A5 tabe-rare-mas-en-kara

A5 tabe-rare-mas-en-kara

= tabe-rare-mas-en-kara

‘since (he) cannot eat (it)’

(23) [waraw-ru]-yōoda

[-A3, +A4]

A3 waraw-u-yōoda

‘seems to laugh’

Rule features [+A4], [-A3] classify suffixes as in (24).

(24) a. unmarked suffixes:

ta, *ru*, *ānai*, *āzuni*, *dake*, imperative *e*, negative *ēn*,

hodo, *imā*̄s, *inā*̄gara, *itā*̄i, ̄kara ‘because’, *rā*̄re, potential ̄e, imperative ̄ro, *sā*̄se, etc.

b. [+A4] suffixes: (cf. RR1)

̄kasira, ̄naNte, *tē*̄mo, *tā*̄ra, *tā*̄ri, *i*̄mos, *yō*̄oda, etc.

c. [-A3] suffixes:

mā̄i, *yō*̄o, *itagā*̄r, *dakē*̄ (cf. Note 1), etc.

Notes

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1. For discussion of these two types of rule ordering, see Muraki 1982.

2. *dake* is also [-A3] in many speakers especially when it is followed by a case-marker, as in (i) and (ii).

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|---|---|
| (i) [atu ¹ me-ta]-dake ¹
[-A3]
A5 atume-ta-dake ¹
‘as much as he has collected’ | (ii) [hatarak-ta]-dake ¹
[-A3]
A5 hatarai-ta-dake ¹
‘as much as he has worked’ |
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Reference

Muraki, Masatake, 1982, “Two types of rule ordering”, *Annual reports*, ICU, 7.137-145.