Allomorph Selection in the Japanese Verb Paradigm

1 Introduction

The Japanese verb paradigm is interesting from a linguistic perspective in that it displays several types of phonological alternations that are rarely or never encountered elsewhere in the language, yet conspire to conform to general phonotactic constraints. For example, the non-past suffix takes the form *-u* when it follows a stem ending in a consonant, but *-ru* when the stem ends in a vowel. Thus we have *nom-**u*** 'drink' but *tabe-**ru*** 'eat'. Many other verbal suffixes share this pattern, which can be analyzed as a process that deletes the second of two sequential consonants or vowels (Kuroda 1965; McCawley 1968).

Such a process would seem to be driven by a pressure to ensure CV syllable structure. But Japanese tolerates vowel hiatus, and uses other strategies to resolve consonant clusters (e.g. gemination). Another set of suffixes, the *t-suffixes* (*-te*, *-ta*, *-tari*, *-tara*, and *-tatte*), show various other processes, including gemination, assimilation, epenthesis, and apparent conversion of consonants into vowels. Some of these occur elsewhere in the grammar, but others do not. Ideally, we would like to be able to explain why such allomorphy occurs only where it does.

In this paper I explore a proposal by Ito and Mester (2004), in which lexically specified allomorphs are selected by the phonology via the normal mechanisms of (classic) Optimality Theory. While promising in its handling of the basic facts, there are several outstanding problems that prevent the theory from deriving the complete verbal paradigm. In particular, it cannot handle the full range of alternations induced by the t-suffixes—a direct application of the theory requires redundant lexical specification of two allomorphs for every stem, and still fails to generate the correct results. The primary purpose of this paper is to demonstrate where the problems arise and why.

2 Allomorph selection

In Ito and Mester's analysis, we consider all possible mappings from underlying to surface form, including every possible combination of lexically specified allomorphs, and let OT select the best mapping as usual. Following Ito and Mester (2015), we aim to derive Japanese verbal allomorphy using constraints on syllable structure.

Consider the CC/VV deletion case described above. We must assume that the constraints ONSET and NOCODA are ranked low in Japanese, since vowel hiatus and consonant clusters are possible. If we assume that the nonpast suffix has only a single underlying form *-ru*, we are forced to posit high-ranking faithfulness constraints specific verbal stems and suffixes in order to trigger deletion in the suffix. If the nonpast suffix in fact has two underlying forms *-u* and *-ru*, then no context-specific constraints are needed. The candidate [nom-u] is fully faithful to /nom+u/, and is preferred over any surface forms derived from /nom+ru/, while [tabe-ru] is still correctly chosen via /tabe+ru/.

Tableaus are given in Figure 1. Two markedness constraints which apply widely are included: CODACOND, which bans codas with an independent place of articulation, and *DD, which bans voiced obstruents clusters. FAITH is a shorthand for all faithfulness constraints.

/nom+<u,ru>/	CODACOND	FAITH	ONSET	NOCODA
☞ a. nom-u				
b. nom-ru	*!			*
c. no-ru		*!		
d. nom-mu		*!		*

/tabe+<u,ru>/	*DD	FAITH	ONSET	NOCODA
a. tabe-u			*!	
☞ b. tabe-ru				
c. tab-u		*!		
d. tab-bu	*!	*		*

Figure 1: Allomorph selection analysis for non-past suffix

This approach has a number of advantages. It captures the majority of the paradigm with a small number of well-motivated constraints, and correctly pairs the forms of irregular suffixes (whose allomorphs are not similar in form) with the correct stems in the same manner as with regular suffixes. It also does so using only mechanisms that are independently necessary (a mapping from underlying to surface forms and a lexicon capable of storing multiple forms of a morpheme).

3 The problem with the t-suffixes

The *t-suffixes* (*-te*, *-ta*, *-tari*, *-tara*, and *-tatte*) behave differently from the main paradigm but identically to each other. Because of this, I will take the past tense suffix *-ta* as representative. When a t-suffix is attached to a stem, both the final consonant of the stem and the initial consonant of the suffix may change. Furthermore, C-stems behave differently according to the exact identity of the consonant. For example, the past tense of *kaer-u* 'buy' is *kae**t**-ta*, an instance of geminate formation, while the past tense of *nak-u* 'cry' is *na**i**-ta*, an instance of C-to-V conversion.

It is possible to derive some of these alternations using only well-motivated markedness constraints, but the alternations seen in s-, k-, and g-stems are not amenable to such an analysis, pushing us towards lexical specification, in this case for the stems. It is not clear whether this is plausible, since we would be claiming lexical specification of a huge number of allomorphs whose relations are entirely predictable. Leaving aside this issue, we are able derive the past tense of s- and k-stem verbs in this manner, but not g-stems, which undergo C-to-V conversion in the stem but also require voicing in the suffix: *oyog-u* 'swim' becomes *oyoi-da* (see Figure 2).

/<oyog,oyoi>+ta/	CodaCond	*DD	Faith	NoCoda
a. oyog-ta	*!			*
☹ b. oyoi-da			*!	
☞ c. oyoi-ta				
d. oyot-ta			*!	*
e. oyod-da		*!	*	*

Figure 2: Allomorph selection with a g-stem verb and a t-suffix

That the theory should fail here is unsurprising since it is a case of opacity—we need to select the vowel-final allomorph, but we also need the information in the consonant-final allomorph in order to derive voicing in the suffix. But there is another, more severe problem: the analysis also predicts that any vowel-final stem will be a perfect fit for any consonant-initial suffix, e.g., **oyoi-ru* should be just as good as *oyog-u*. If the allomorph selection theory cannot modified to solve these problems, then we may have to conclude that the grammar of Japanese does in fact include phonological processes which are restricted in application to certain verbal suffixes.

References

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