[r]-epenthesis in Fukuoka Japanese verbal inflection

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1 Introduction

Bloch (1946) observed that each verbal inflectional suffix in Japanese comes in two allomorphs, such as *-ru* and *-u*, depending on the form of the stem. The vowel-initial variant of the suffix (e.g., *-u*) attaches to the stem if the stem ends with a consonant while the consonant-initial variant (e.g., *-ru*) is used if the stem ends with a vowel. Subsequent literature on the Japanese morpho-phonology has analyzed this allomorphy in generally one of two ways: One is to assume the underlying form of the suffix as the vowel-initial one, and analyze the consonant-initial allomorph as being derived from epenthesis of a consonant. The other is to assume the underlying form as the consonant-initial one, and analyze the vowel-initial allomorph as arising from deletion of the initial consonant.

Even though the two analyses are equally adequate for the data in standard Modern Japanese, De Chene (2010) argues that evidence from regional dialects suggests that the epenthesis process assumed in the first analysis is active in certain dialects, providing support for the epenthesis analysis of Japanese verbal inflection in general. In this paper, I present further argument for the epenthesis analysis of Japanese verbal inflection, based on evidence from Fukuoka Japanese. In Fukuoka, negative inflection with the suffix *-aN* involves an extra insertion of *ra* right before the suffix when the verbal stem is monomoraic. Also, the hortative form *-joo* turns to *-roo*, again, when the stem is monomoraic. I will argue that these phenomena can be analyzed as arising from epenthesis of [r] conditioned by the accentual preference of the dialect. Specifically, the accentual preference requires the verb-complex to be of a certain length for it to be satisfied, causing extra epenthesis if possible. Crucially, as I will argue, the analysis has to be based on the epenthesis analysis of general verbal inflection to achieve a unified analysis of the two cases. Thus, these phenomena in Fukuoka Japanese corroborate De Chene's (2010) argument for the epenthesis analysis of the general Japanese verbal inflection.

The rest of the paper will be structured in the following way. In Section 2, I will give an overview of the basic verbal inflection paradigm in Standard Japanese, as well as the [r]-epenthesis analysis of the paradigm, which will be assumed in my analysis of Fukuoka Japanese. Next, I detail the phenomenon of *ra*-insertion in the negative verbal inflection

in Fukuoka. The phenomenon is analyzed in Section 4 in terms of [r]-epenthesis governed by the accentual constraints in Fukuoka. In the same section, I also discuss the dialectical variation between Fukuoka and Tokyo. Another [r]-epenthesis phenomenon in Fukuoka, i.e., the change of the hortative suffix /-joo/ to [roo], is discussed in Section 5. There, it is argued that the phenomenon can be captured by the same analysis as in the previous section, providing further support for the analysis. Finally, Section 6 discusses the implication of the current analysis on the general analysis of Japanese verbal inflection. It will be argued that the unified analysis of the [r]-epenthesis phenomena in Fukuoka requires the [r]-epenthesis analysis of the general verbal inflection, as opposed to the [r]-deletion analysis or the hybrid parallel analysis by Ito and Mester (2004).

2 Basic verbal inflection paradigm in Japanese

2.1 C-ending stems and V-ending stems

Japanese has an agglutinative verbal inflection system, where each inflectional suffix attaches to a verbal stem. Descriptively, the inflectional suffixes exhibit alternation depending on whether the verbal stem ends with a consonant or a vowel. Henceforth, I will refer to the first type of verb stem as C-stem and the latter as V-stem. Both types of verbs are exemplified below with inflection in the indicative form and the negative form.

(1) **C-stem words**
   a. Stem: *watar* '(to) go across'; *watar-u* (indicative), *watar-anai* (negative)
   b. Stem: *mat* '(to) wait'; *mats-u* (indicative), *mat-anai* (negative)

(2) **V-stem words**
   a. Stem: *mi* '(to) see'; *mi-ru* (indicative), *mi-nai* (negative)
   b. Stem: *tabe* '(to) eat'; *tabe-ru* (indicative), *tabe-nai* (negative)

The partial inflectional paradigm depending on the type of the stem is summarized in the following table taken from De Chene (2010).

(3)

suffix	C-stem '(to) go across'	V-stem '(to) see'	Alternation
Indicative	watar-u, mat-u	mi-ru, tabe-ru	$\varnothing \sim r$
Provisional	watar-eba, mat-eba	mi-reba, tabe-reba	$\varnothing \sim r$
Passive	watar-are, mat-are	mi-rare, tabe-rare	$\varnothing \sim r$
Hortative	watar-oo, mat-oo	mi-joo, tabe-joo	$\varnothing \sim j$
Causative	watar-ase, mat-ase	mi-sase, tabe-sase	$\varnothing \sim s$
Negative	watar-a-na(i), mat-a-na(i)	mi-na(i), tabe-na(i)	$a \sim \varnothing$
Infinitive	watar-i, mat-i	mi-$\varnothing$, tabe-$\varnothing$	$i \sim \varnothing$

2.2   [r]-epenthesis analysis

Let us now consider how the alternation given in (3) can be analyzed. In this section, I will summarize an analysis based on epenthesis of [r] in the suffixation of V-stem verbs. This analysis, hereafter the [r]-EPENTHESIS ANALYSIS, will be the basis for the analysis of the problematic phenomenon in Fukuoka Japanese that will be introduced in the next section. Two other plausible analyses of the Japanese verbal inflection, which I will refer to as the DELETION ANALYSIS and the PARALLEL ANALYSIS, will be discussed in Section 6, in connection with the proposed analysis of Fukuoka Japanese.

The [r]-epenthesis analysis assumes the C-stem alternants as basic, and derives the forms in the V-stem cases by [r]-epenthesis (e.g., De Chene 1985, 2010). More specifically, in this analysis, I assume that the top ranked *V+V i.e., the constraint against a hiatus ranging over a morpheme boundary, is satisfied in violation of $\text{DEP}_{\text{aff}}(r)$, which is lower-ranked than MAX_{aff}. The tableau for the provisional form of *mi-reba* 'if one sees' is shown below.

(4)   **[r]-epenthesis analysis**: Phonotactics (e.g., *V+V) $\gg \text{MAX}_{\text{aff}} \gg \text{DEP}_{\text{aff}}(r)$

/mi + eba/	*V+V	MAX_{aff}	$\text{DEP}_{\text{aff}}(r)$
a. [mi-eba]	*		
☞ b. [mi-reba]			*
c. [mi-ba]		*	

Regarding the hortative and the causative form, the analysis assumes that /joo/ and /sase/ are available as an underlying form of the suffixes respectively, which starts with a consonant unlike other suffixes such as the indicative and the provisional suffix. When the suffixes /joo/ and /sase/ attach to a C-stem, the sequence of the stem-final consonant and the suffix-initial consonant leads to a violation of the undominated phonotactic constraint *[–syll]+[–syll] (or *[–σ]+[–σ]), which penalizes a sequence of multiple non-syllabic segments ranging over a morpheme boundary. The repair using the deletion of the stem-final consonant is ruled out because MAX_{stem} outranks MAX_{aff}. This is illustrated in the following tableau.

(5)

/watar + joo/	*V+V	*[–σ]+[–σ]	MAX_{stem}	MAX_{aff}	$\text{DEP}_{\text{aff}}(r)$
a. [watar-joo]		*			
b. [watar-rjoo]		*			*
☞ c. [watar-oo]				*	
d. [wata-joo]			*		

Although the above analysis correctly accounts for the suffixation of the first five suffixes in (3), it is clear that this simplistic analysis has problems considering the negative and infinitive forms in (3). The analysis incorrectly predicts epenthesis of [r] in the V-stem case. For example, in the negative form, epenthesizing [r] to the underlying *mi+anai* leads to unattested **mi-ranai*.

The modification I propose here is to assume that epenthesis in the negative and the infinitive suffixes is more costly than in other suffixes. Treating the negative and the infinitive suffixes as special might appear to be stipulative. However, as Shibatani (1990, 224–225)

argues based on the tradition of classical Japanese grammar, the negative 'suffix' *anai* can be decomposed into the verbal inflectional ending *a* plus the negative auxiliary *nai*, as schematized in the following.

(6)   Stem + $\underbrace{\text{Inflectional ending} + \text{Auxiliary}}_{\text{suffix}}$

(7)   a.   *watar* + *a* + *nai* 'not to go across'
      b.   *mi* + ∅ + *nai* 'not to see'

This decomposition is plausible since the same inflectional ending occurs with other auxiliaries such as the conjectural *mu* or conjunctive particle *ba* in Classical Japanese, and the inflectional ending *a* itself does not bear a specific meaning. Similarly, the infinitive 'suffix' occurs with multiple auxiliaries such as *masu* (politeness) and *tai* (desiderative) also in modern Japanese. Examples of combinations of the inflectional ending and the auxiliary are listed below.

(8)

	Stem	Infl. ending	Auxiliary
Indicative	watar	∅	u
Provisional	watar	∅	eba
Negative	watar	a	nai
Conjectural (classic)	watar	a	mu
Conjunctive (classic)	watar	a	ba
Infinitive+Polite	watar	i	masu
Infinitive+Desiderative	watar	i	tai

Assuming this view that *a* in the negative suffix and the infinitive suffix *i* are inflectional endings of the verb, it is plausible to posit distinct DEP and MAX constraints targeting different morphological contexts such that deletion is preferred in the context of inflectional endings while epenthesis is preferred in the context of auxiliaries.[1] Specifically, I modify the [r]-epenthesis analysis by positing different relative ranking of $\text{DEP}(r)$ and MAX for inflectional endings and auxiliaries: $\text{DEP}_{\text{inf}}(r) \gg \text{MAX}_{\text{inf}}$ and $\text{MAX}_{\text{aux}} \gg \text{DEP}_{\text{aux}}(r)$. This has the effect of forcing deletion in inflectional endings, but epenthesis in auxiliaries. The derivation of *minai* based on this constraint ranking is shown in the following tableau.[2]

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[1]One could motivate the dispreference against deletion in auxiliaries if there is a principle that avoids deletion of a segment in a meaningful morpheme. Since auxiliaries but not inflectional endings bear their own meanings, such a principle dictates that epenthesis is preferred over deletion in auxiliaries.

[2]Epenthesis of [r] in a medial position (as in *minari) is ruled out by CONTIGUITY, which is formulated as follows (Kenstowicz 1994).

(1)   CONTIGUITY: if /...xy.../ are contiguous in lexical structure then avoid [...xay...] in prosodic structure, where [a] is either [ ] (epenthetic material) or ⟨a⟩ (underparsed material).

Since the diphthong /ai/ is contiguous in the lexical representation of the negative auxiliary, CONTIGUITY bans epenthesis between the two vowels. On the other hand, it does not penalize the epenthesis of [r] between the stem and the suffix in /mi+eba/ in (10) since there is no *lexical* structure in which the vowels /i/ and

(9)

/mi + a + nai/	*V+V	DEP$_\text{stem}$(r)	DEP$_\text{inf}$(r)	MAX$_\text{inf}$
☞ a. [mi-nai]				*
b. [mir-a-nai]		*		
c. [mi-ra-nai]			*	
d. [mi-a-nai]	*			

Since MAX$_\text{aux}$ is preserved to be above DEP$_\text{aux}$(r) in the constraint ranking, *mireba* (*mi + eba*) can be derived as [r]-epenthesis, in the same way as in (4) (Note that the data at this point is undecisive about how the Faithfulness constraints targeting inflectional endings and those targeting auxiliaries are ranked with each other, e.g., whether DEP$_\text{inf}$(r) outranks MAX$_\text{aux}$.):

(10)

/mi + ∅ + eba/	*V+V	MAX$_\text{aux}$	DEP$_\text{aux}$(r)
a. [mi-∅-eba]	*		
☞ b. [mi-∅-reba]			*
c. [mi-∅-ba]		*	

On the other hand, the inflection of C-stem verbs can be treated as a simple suffixation of the stem and the underlying form of the suffix (i.e., the inflectional ending + the auxiliary). For example, in the case of the provisional form *-eba*, which co-occurs with the zero inflectional ending, the suffix can be attached to a C-stem without any violation of phonotactic constraints. The same happens with the case of the negative form *-anai*, in which *a* is the inflectional ending.

Before concluding the section, I address one concern that might arise concerning the distribution of inflectional endings in (8). In (8), the inflectional ending that co-occurs with a vowel-initial auxiliaries is always ∅, but one might suspect that the inflectional endings are underlyingly a vowel across-the-board. Even if this is true, the prediction of the analysis does not change as soon as we make one further assumption that MAX$_\text{inf}$ is dominated by DEP$_\text{aux}$(r). Roughly, this is so because such a vowel (as an inflectional ending) would be deleted as it would create a hiatus with either the stem-final vowel or the auxiliary-initial vowel. In the V-stem case, there would be two adjacent hiatuses (i.e., a sequence of three vowels). The former hiatus will be resolved by deleting the inflectional ending while the latter will be resolved by [r]-epenthesis. In the C-stem case, there would be a hiatus consisting of the inflectional ending and the auxiliary-initial vowel. This would be resolved by deleting the inflectional ending assuming the ranking DEP$_\text{aux}$(r) ≫ MAX$_\text{inf}$. These two cases are illustrated in the following tableaux.

/e/ are contiguous.

(11)

/mi + V + eba/	*V+V	MAX$_{\text{stem}}$	MAX$_{\text{aux}}$	DEP$_{\text{aux}}$(r)	DEP$_{\text{inf}}$(r)	MAX$_{\text{inf}}$
a. [mi-V-eba]	**					
b. [mi-∅-eba]	*					*
☞ c. [mi-∅-reba]				*		*
d. [m-V-reba]		*		*		
e. [mi-∅-ba]			*			*
f. [mi-rV-reba]				*	*	

(12)

/watar + V + eba/	*V+V	MAX$_{\text{stem}}$	MAX$_{\text{aux}}$	DEP$_{\text{aux}}$(r)	DEP$_{\text{inf}}$(r)	MAX$_{\text{inf}}$
a. [watar-V-eba]	*					
b. [watar-V-reba]				*		
☞ c. [watar-∅-eba]						*
d. [watar-Vr-eba]					*	
e. [watar-V-ba]			*			

In what follows, I will continue to assume that the inflectional endings for the vowel-initial auxiliaries (i.e., *u* and *eba*) is ∅, and will be agnostic about the relative ranking of DEP$_{\text{aux}}$(r) and MAX$_{\text{inf}}$.

Summing up the section, I here presented the [r]-epenthesis analysis of the alternations in the Japanese verbal inflection paradigm in (3). The analysis assumes the underlying forms of the suffixes to be the C-stem alternants and derives the V-stem alternants by [r]-epenthesis. This is basically formulated by positing MAX outranking DEP(r) so that the epenthesis takes place when the simple suffixation violates the undominated phonotactic constraints of Japanese (in particular *V+V). Although the inflectional pattern of the negative form and the infinitive form (in which the suffixation in the V-stem case involves a deletion instead of an [r]-epenthesis) cannot be accounted for in this simple analysis, breaking down the faithfulness constraints into distinct constraints targeting different morphological contexts enables us to account for the whole range of data. Specifically, the ranking DEP$_{\text{inf}}$(r) ≫ MAX$_{\text{inf}}$ and MAX$_{\text{aux}}$ ≫ DEP$_{\text{aux}}$(r) predicts that the epenthesis takes place in the auxiliary, but a deletion is preferred if the epenthesis is forced to be in the inflectional ending. The former case corresponds to the [r]-epenthesis in forms with the zero inflectional ending, such as the indicative form and the provisional form. The latter case corresponds to the deletion in forms with an overt inflectional ending, such as the negative form and the infinitive form.

3   The insertion of *ra* in Fukuoka Japanese

In this section, I describe a phenomenon in the Fukuoka dialect of Japanese that cannot be straightforwardly accounted for by the basic analysis of Japanese verbal inflection reviewed in the previous section.[3] The core data we consider concerns the negative form of verbs in

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[3]The Fukuoka dialect of Japanese is spoken mainly in the Fukuoka prefecture of Japan, which is located in the north of the Kyushu island. The judgments in the current paper are based on the intuition of the author, who is a native speaker of the dialect, and on a descriptive grammar of the morphology of Fukuoka Japanese by Hayata (1985).

Fukuoka Japanese. In Fukuoka Japanese, the negative verbal suffix is *-aN*, where *a* is the inflectional ending and *N* is the auxiliary. The examples are given in the following, where (13) lists the C-stem verbs and (14) lists the V-stem verbs. As should be clear from the examples, the suffix alternates between *-aN* and *-N* depending on the type of the verb.

Fukuoka Japanese: the negative form *-aN*

(13) a. watar-u '(to) go across'
          watar-aN 'not to go across'

   b. nom-u '(to) drink'
       nom-aN 'not to drink'

   c. yak-u '(to) burn'
       yak-aN 'not to burn'

   d. de-ru '(to) go out'
       de-N 'not to go out'

   e. ne-ru '(to) sleep'
       ne-N 'not to sleep'

   f. tabe-ru '(to) eat'
       tabe-N 'not to eat'

(14) a. mi-ru '(to) see'
          mi-N 'not to see'

   b. ki-ru '(to) wear'
       ki-N 'not to wear'

   c. oki-ru '(to) get up'
       oki-N 'not to get up'

What is interesting is that there are forms that are optionally available, in addition to the patterns summarized above. Descriptively, only if the stem is monomoraic, *ra* can be inserted before *N*.[4] The examples in (15) show the optional insertion of *ra* in the negative forms having a single-mora stems while those in (18) show that the insertion of *ra* is impossible when the stem has more than one mora.

Fukuoka Japanese: the *ra*-insertion

(15) **monomoraic stems**

   a. de-aN → de-**ra**N ∼ de-N 'not to go out'

   b. ne-aN → ne-**ra**N ∼ de-N 'not to sleep'

   c. mi-aN → mi-**ra**N ∼ mi-N 'not to see'

   d. ki-aN → ki-**ra**N ∼ ki-N 'not to wear'

(16) **non-monomoraic stems**

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[4]It follows that the insertion of *ra* happens only with V-stem verbs since only the stems of V-stem verbs can consist of a single mora.

   a. watar-aN → watar-aN, *watar-a**ra**N 'not to go across',

   b. mat-aN → mat-aN, *mat-a**ra**N 'not to run'

   c. tabe-aN → tabe-N, *tabe-**ra**N 'not to eat'

   d. oki-aN → oki-N, *oki-**ra**N 'not to get up'

For completeness, the examples below show that the *ra*-insertion is impossible in the negative form -*(a)nai* in Tokyo Japanese.

Tokyo Japanese: the negative form -*(a)nai*

(17) **monomoraic stems**

   a. *de-**ra**nai 'not to go out'

   b. *ne-**ra**nai 'not to sleep'

   c. *mi-**ra**nai 'not to see'

   d. *ki-**ra**nai 'not to wear'

(18) **non-monomoraic stems**

   a. *watar-a**ra**nai 'not to go across',

   b. *mat-a**ra**nai 'not to run'

   c. *tabe-**ra**nai 'not to eat'

   d. *oki-**ra**nai 'not to get up'

The [r]-epenthesis analysis of verbal inflection sketched in the previous section predicts the impossibility of the *ra*-insertion in Tokyo Japanese since the suffixation of -*anai* to a V-stem verb involves a deletion of the inflectional ending -*a*. However, it is not obvious what kind of modification we need to account for the *ra*-insertion in Fukuoka. First of all, just treating the negative suffix -*aN* in the same way as the Tokyo negative suffix -*anai* would incorrectly predict that the suffixation involves a deletion of the inflectional ending *a*, but no epenthesis of *r*, as illustrated in the following tableau.

(19)

/mi + a + N/	*V+V	$\text{DEP}_{\text{inf}}(r)$	MAX_{inf}
☞ a. [mi-∅-N]			*
☹ b. [mi-ra-N]		*	
c. [mi-a-N]	*		

Indeed, the form *miN* is optionally available in Fukuoka, but the analysis sketched in (19) does not account for the availability of the form *miraN*.

One might consider a hypothesis in which Fukuoka has two allomorphs *aN* and *raN* as the underlying negative suffix.[5] Under this analysis, the suffix -*raN* can attach to a V-stem without any DEP violation, deriving the *ra*-inserted form. This is shown in the following tableau, taking the verb *mi* as an example.

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[5]This is what seems to be assumed in Hayata's (1985) description of the phenomenon.

(20)

/mi + {aN, raN}/	*V+V	$\text{DEP}_{\text{inf}}(r)$	MAX_{inf}
a. [mi-aN]	*		
b. [mi-N]			*
☞ c. [mi-raN]			

However, the hypothesis still has to explain why the distribution of the allomorph *raN* is limited to the verbs with a *single-mora* stem (see (18)). For example, applying the same analysis as in (20) to the verb *tabe* '(to) eat' would incorrectly predict the *ra*-inserted form **taberan*, which is completely unavailable in Fukuoka.

(21)

/tabe + {aN, raN}/	*V+V	$\text{DEP}_{\text{inf}}(r)$	MAX_{inf}
a. [tabe-aN]	*		
☺ b. [tabe-N]			*
☞ c. [tabe-raN]			

In the next section, I will provide an analysis of this optional *ra*-insertion phenomenon in Fukuoka Japanese in terms of the accentual preferences of the dialect. In this analysis, the difference between Fukuoka Japanese and Tokyo Japanese in the possibility of *ra*-insertion boils down to their difference in the accent systems.

4   An analysis in terms of accent

What makes the insertion of *ra* in a negative form in Fukuoka possible, and why is it impossible in Tokyo? In this section I provide an answer to these questions in terms of the difference in the accent-related constraints between Tokyo and Fukuoka Japanese. Below, I first summarize the accent systems in Tokyo and Fukuoka, and further hypothesize that the constraint requiring an initial rise of a phonological phrase is relatively high-ranked in Fukuoka verbs. We will see that the interaction between this hypothesis and the independently known feature of Fukuoka accent derives *ra*-insertion in Fukuoka.

4.1   The intonational systems of Tokyo and Fukuoka Japanese

Before presenting the analysis of the [r]-epenthesis phenomenon, I review the intonational systems in Tokyo and Fukuoka Japanese, based on Haraguchi (1999), Hayata (1985) and Smith (1999). For the most part, Tokyo and Fukuoka have similar intonational patterns. In both dialects, an accent is realized as a HL tone (e.g., Pierrehumbert and Beckman 1988). An accent for verbs and adjectives falls on the penultimate mora. Furthermore, both dialects share the LH tone in the beginning of each (minor) phonological phrase (except when the accent falls on the initial mora) (Haraguchi 1975, Pierrehumbert and Beckman 1988). I will refer to this phenomenon as the INITIAL RISE.

Thus, the accented verbs in the following list have the same intonational patterns in Tokyo and Fukuoka Japanese.

(22) **Both Tokyo and Fukuoka: verb indicative form (accented)**

    a. tabe-ru '(to) eat' LHL
         de-ru '(to) go out' HL
         oki-ru '(to) get up' LHL
         mi-ru '(to) see' HL

    b. kat-u '(to) win' HL
         kakus-u '(to) borrow' LHL
         yorokob-u '(to) rejoice' LHHL

In all of the above cases, we see that there is an accent realized as a fall on the penultimate mora. Also, there is an initial rise unless the accent falls on the first mora (namely in *de-ru*, *mi-ru*, and *ka-tu*).

    However, the two dialects differ as to whether the accent is obligatory in verbs and adjectives. Unaccented verbs and adjectives exist in Tokyo Japanese, but all Fukuoka verbs and adjectives are accented (Hayata 1985).[6] This is illustrated in the following examples.

(23) **Tokyo: verb indicative form**

    a. ki-ru '(to) wear' LH
         ne-ru '(to) sleep' LH

    b. wur-u '(to) sell' LH
         watar-u '(to) go across' LHH
         susum-u '(to) advance' LHH
         utagaw-u '(to) doubt' LHHH

(24) **Fukuoka: verb indicative form**

    a. ki-ru '(to) wear' HL
         ne-ru '(to) sleep' HL

    b. wur-u '(to) sell' HL
         watar-u '(to) go across' LHL
         susum-u '(to) advance' LHL
         utagaw-u '(to) doubt' LHHL

    Thus, Tokyo Japanese and Fukuoka Japanese show the same intonational pattern for verbs if the verb is accented, but they differ as to whether the accent is obligatory. This variation can be captured in the following simple OT analysis, following Smith (1999). AC-CENTEDNESS refers to the markedness constraint that penalizes non-accented words. The position of accent is constrained by a set of independent constraints.

(25)   a. **Fukuoka**: DEP$_N$(Accent) ≫ ACCENTEDNESS ≫ DEP(Accent)
        b. **Tokyo**: DEP(Accent) ≫ ACCENTEDNESS

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[6]On the other hand, accents of Fukuoka nouns are contrastive. See Smith (1999) for the analysis of the asymmetry between nouns and verbs/adjectives in Fukuoka in the framework of positional faithfulness.

Since accents are contrastive in Fukuoka nouns, just as in Tokyo, DEP_N(Accent), i.e., the DEP-constraint specifically targeting noun accents is posited independently of the general DEP(Accent), and ranked higher than ACCENTEDNESS (Smith's 1999 "Noun-faithfulness"). The obligatoriness of accent in Fukuoka verbs is captured by the fact that ACCENTEDNESS outranks DEP(Accent). Unlike in Fukuoka, the general DEP(Accent) outranks ACCENTEDNESS in Tokyo. This results in the fact that accented nouns and unaccented nouns are contrastive in Tokyo Japanese.

4.2   Deriving *ra*-insertion

In the last section, I described the difference in the basic accent patterns in Tokyo and Fukuoka Japanese. In this section, I make an additional hypothesis regarding a difference in the intonation of two dialects, and derive the possibility/impossibility of *ra*-insertion.

The additional hypothesis concerns the constraint requiring an initial rise in a phonological phrase. More specifically, the claim is that the constraint requiring an initial rise outranks DEP_{inf}(r) in Fukuoka, but not in Tokyo. We will see that *ra*-insertion falls out straightforwardly given this hypothesis and the general intonational system in Fukuoka Japanese.

The starting point is the [r]-epenthesis analysis for the Japanese verb inflection reviewed in Section 2.2. The constraint ranking we considered for the [r]-epenthesis analysis looks like the following:

(26) a. *V+V $\gg$ MAX_{aux} $\gg$ DEP_{aux}(r)
      b. *V+V $\gg$ DEP_{inf}(r) $\gg$ MAX_{inf}

My proposal is to consider the interaction between these constraints and another pair of constraints pertaining to the intonation, i.e., INITRISE and ACCENT=PENULT, defined as follows:[7]

(27) a. INITRISE: Penalize a phonological phrase with no initial LH tone.

      b. ACCENT=PENULT: Penalize a phonological phrase with no penultimate accent.

Between these constraints, ACCENT=PENULT is ranked higher since verbs with two morae in Fukuoka have an HL tone, violating INITRISE while preserving the penultimate accent. Also, I propose that these intonational constraints outrank the constraints in (26), except for the undominated *V+V. Thus, the proposed ranking for Fukuoka Japanese will be the one in (28). Given this ranking, *ra*-insertion is derived as shown in the tableau in (29).

(28) a. *V+V, ACCENT=PENULT $\gg$ INITRISE $\gg$ MAX_{aux} $\gg$ DEP_{aux}(r)
      b. *V+V, ACCENT=PENULT $\gg$ INITRISE $\gg$ DEP_{inf}(r) $\gg$ MAX_{inf}

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[7]Of course, each of these constraints could be further analyzed as the result of the interaction between several constraints, but the goal here is to derive the *ra*-insertion given the constraints in (27).

(29)

/ki + a + N/	*V+V	ACCENT=PENULT	INITRISE	DEP$_\text{inf}$(r)	MAX$_\text{inf}$
a. [ki-∅-N']		*			*
b. [ki'-∅-N]			*		*
☞ c. [ki-ra'-N]				*	
d. [ki-a'-N]	*				

What is crucial here is that INITRISE and ACCENT=PENULT outrank DEP$_\text{inf}$(r), forcing the epenthesis of [r] in cases where the epenthesis would repair a violation of the intonational constraints. The candidates [ki'n] and [kin'] violate one or the other intonational constraints: Since they consist of only two morae, respecting INITRISE would violate ACCENT=PENULT and vice versa. Epenthesis of [r] between the stem and the suffix solves this issue while respecting all the higher-ranked constraints. The unaccented candidate [kin] is ruled out due to the independent fact that ACCENTEDNESS outranks DEP(Accent) in Fukuoka, as discussed in the previous section.

This analysis captures the fact that the epenthesis occurs only when the stem consists of a single mora. If the stem is longer than a single mora, it is possible to satisfy both INITRISE and ACCENT=PENULT. Thus, the epenthesis of [r] is not necessary. This is illustrated in the following tableau.

(30)

/tabe + a + N/	*V+V	ACCENT=PENULT	INITRISE	DEP$_\text{inf}$(r)	MAX$_\text{inf}$
☞ a. [tabe'-∅-N]					*
b. [tabe-ra'-N]				*	
c. [tabe-a'-N]	*				

Importantly, the analysis does not predict the insertion of *ra* in any case where the regular suffixation ends up in a two-mora verb. The only suffixes that are short enough to create a two-mora verb are the indicative suffix *-(r)u* and the past-tense suffix *-ta*, but inserting [r] between a verb stem and the suffix requires an extra vowel to satisfy the phonotactics. Assuming that DEP(V) is another undominated constraint, such an epenthesis is ruled out. This is shown in the following tableaux.

(31)

/ki + ∅ + u/	DEP(V)	*V+V	ACCENT=PENULT	INITRISE	MAX$_\text{aux}$	DEP$_\text{aux}$(r)
a. [ki'-∅-u]		*		*		
☞ b. [ki'-∅-ru]				*		*
c. [ki-∅-ru']			*			*
d. [ki-∅-rV'ru]	*					**

(32)

/mat + ∅ + u/	DEP(V)	*V+V	ACCENT=PENULT	INITRISE	DEP$_\text{inf}$(r)	MAX$_\text{inf}$
☞ a. [ma't-∅-u]				*		
b. [mat-V'r-u]	*				*	

Just epenthesizing an extra [r] in this case does not guarantee that the verb is long enough to satisfy the intonational constraints. In order for the verb to be long enough to have three morae, we would need an extra vowel. However, epenthesis of a vowel is more costly than violating INITRISE. Thus, we derive two-mora verbs like *kiru* or *matu*, with the HL intonation.

4.3   Dialectical variation and optionality

The analysis presented in the previous section correctly derives *ra*-insertion of the negative inflection in Fukuoka Japanese. However, so far, I have not addressed the question of how we can account for the cross-dialectical difference between Tokyo and Fukuoka in the existence/absence of *ra*-insertion, nor the optionality of *ra*-insertion in Fukuoka. In this section, I offer an account that treats both of these variations modulo the lexical difference between Fukuoka and Tokyo.

4.3.1   Dialectical variation

In the analysis presented in the previous section, the crucial constraint ranking that drives the *ra*-insertion is that of INITRISE outranking $\text{DEP}_{\text{inf}}(r)$. Suffixing -*aN* to a single-mora stem with epenthesis of [r] is preferred over deletion of the inflectional ending *a*, since the latter results in a form that inevitably violates INITRISE (given that the accent falls on the penultimate mora) while the former does not.

On the other hand, *ra*-insertion never occurs in Tokyo Japanese, as described in Section 3. To capture this fact, I argue that INITRISE is outranked by $\text{DEP}_{\text{inf}}(r)$ in the Tokyo grammar. It is straightforward to see how this ranking gives us the fact that *ra*-insertion never occurs in Tokyo. If INITRISE is below $\text{DEP}_{\text{inf}}(r)$, the intonational constraints do not force [r]-epenthesis in the cases where the regular suffixation involves a deletion. Thus, such a ranking would correctly predict the absence of *ra*-insertion. This is illustrated in the following tableau.

(33)

/de + a + na(i)/	*V+V	ACCENT=PENULT	$\text{DEP}_{\text{inf}}(r)$	INITRISE	MAX_{inf}
☞ a. [de'-∅-na(i)]				*	*
b. [de-ra'-na(i)]			*		
c. [de-a'-na(i)]	*				

Here, crucially, the candidate [*de-na'i] with the accent on the second mora is ruled out independently. This is because of the extrametricality of the final *i* in the auxiliary -*nai*. Otherwise, [*de-na'i] would be incorrectly predicted to be the optimal output since it would violate neither INITRISE nor $\text{DEP}_{\text{inf}}(r)$. The extrametricality can be independently tested with the following example in Tokyo.

(34)   ✓mat-a'-nai / *mat-a-na'i 'not to wait'

It is not clear if we can derive this apparent extrametricality of -*anai* from a general constraint. One possibility is to assume the accent placement of Japanese verbs as syllable-based instead of mora-based, and derive the extrametricality of -*anai* from NONFINALITY. However, this hypothesis cannot be tested with other suffixes because there is no unaccented suffix ending with a long syllable. All suffixes with a long syllable i.e., -*roo* and -*tai* have an inherent penultimate accent, as shown by the cases in which they attach to an unaccented verb e.g., [watar-o'o], [watar-i-ta'i].

4.3.2   Optionality of *ra*-insertion in Fukuoka

In Section 3, I described the *ra*-insertion as optional in Fukuoka Japanese. For example, there is optionality between *kiN* and *kiraN*, as well as between *deN* and *deraN*. I propose that the optionality is actually a populational difference. That is, there are two populations in Fukuoka having different grammars, one with the ranking INITRISE $\gg$ DEP$_{\text{inf}}$(r) and the other with the ranking DEP$_{\text{inf}}$(r) $\gg$ INITRISE. The former grammar leads to *ra*-insertion whereas the latter doesn't, just as in Tokyo Japanese. This view based on the populational variation has indirect support from the fact that there are regions in Fukuoka in which solely the *ra*-inserted forms or solely the non-*ra*-inserted forms are used for negative suffixation with single-mora stems. According to the dialect atlas created by National Institute for Japanese Language and Linguistics (1989–2006), only the *ra*-inserted form is used in the eastern and northeastern areas of Fukuoka, and only the non-*ra*-inserted form is used in a southern area of Fukuoka.[8] This suggests that there are distinct grammars within the Fukuoka dialect that differ in whether it derives *ra*-insertion. As for the speakers who have optionality of *ra*-insertion, it is plausible that the two grammars are available to the speakers. At this point, I have to leave it for future research to investigate whether there is further evidence for the analysis of optionality in terms of the underlying grammar difference.

5   Further evidence from the modal suffix *-joo*

In this section, I give further evidence for the proposed analysis of *ra*-insertion in Fukuoka Japanese. The evidence comes from the modal suffix *-joo*. According to Hayata's (1985) description, the stem-final vowel undergoes a glide-formation when the stem is of multiple morae, but becomes *-roo* when the stem is a vowel-final and monomoraic. I argue that this analysis can be accounted for by a straightforward extension of the proposed analysis of *ra*-insertion, providing further evidence for the analysis.

5.1   Description in Hayata (1985)

The verbal inflection paradigm in Tokyo Japanese summarized in Section 2 contains the pattern for the hortative modal suffix *-joo*. The suffix attaches without deletion or epenthesis to V-stems while just *-oo* without the initial *j* is attached to a C-stem. Fukuoka Japanese has the same suffix, and the same pattern arises in the C-stem case:

(35)   **Consonant-ending stem**
    a. tor-oo 'let's take'

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[8]There are other areas of Japan in which the negative suffix is *-aN* as in Fukuoka, but *ra*-insertion is not observed. These areas include the majority of Shikoku, Chugoku and Hokuriku areas. I speculate that these areas have the Tokyo-type grammar in which one of the intonational constraints such as INITRISE is outranked by DEP$_{\text{inf}}$(r), so that the accentual requirements do not force [r]-epenthesis. However, since evaluating this hypothesis requires a thorough review of the accent systems in the dialects, I will rather focus on the comparison between Tokyo and Fukuoka in the current paper.

    b. tat-oo 'let's stand'

    c. kak-oo 'let's write'

On the other hand, unlike in Tokyo, the suffixation of *joo* with a V-stem in Fukuoka undergoes a shortening of the /ej/-sequence consisting of the stem-final vowel and the suffix-initial /j/ into just /j/, giving rise to the pattern exemplified below (Hayata 1985).[9]

(36) **Vowel-ending stem (Non-monomoraic)**

    a. tabe + joo $\rightarrow$ tab-joo 'let's eat'

    b. oki + joo $\rightarrow$ ok-joo 'let's get up'

What is important in the current context is that the shortening only applies to the V-stems with multiple morae, and that there is optional [r]-epenthesis when the V-stem is monomoraic. This is shown in the following examples.

(37) **Vowel ending stem (Monomoraic)**

    a. de-oo $\rightarrow$ de-joo $\sim$ de-roo 'let's go out'

    b. mi-oo $\rightarrow$ mi-joo $\sim$ mi-roo 'let's see'

In the next subsection, I will extend the analysis presented in the previous section to capture these facts, and discuss how it provides us with further evidence for the proposed analysis of the Fukuoka morpho-phonology.

5.2 Extending the analysis

Let us start with the analysis of the shortening phenomenon in the case of non-monomoraic V-stems. The phenomenon can be analyzed as a repair for the violation of the markedness constraint against a vowel-glide sequence ranging over a morpheme boundary i.e., *V+j. Attaching the suffix *-joo* to a V-stem would create such a sequence, and shortening is the least costly repair. In the following tableau, this is shown by the fact that [tabj-o'o], which does not contain the /ej/ sequence, is chosen as the optimal candidate despite its violation of *IDENT(syllabic).[10,11] Also, note that the sequence [bj] here does not violate the constraint *[–syll]+[–syll] that is used in Section 2 to capture the deletion of the initial /j/ in *joo* when it attaches to a C-stem. This is because the [bj] sequence here does not range over a morpheme boundary.

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[9]The description of the pattern here is based on Hayata's (1985) fieldwork with the older generation of Fukuoka speakers (born in the early 20th century). The younger generation speakers including the author do not produce the shortened forms as in (36) or the [r]-epenthesized forms in (37), and use the non-shortened forms throughout just as in Tokyo Japanese. This fact is presumably due to the influence of Tokyo Japanese on the younger speakers.

[10]The younger generation who prefer the non-shortened form discussed in fn. 9 is considered to have a grammar in which *V+j is not effective. That is, it is either non-existent or low-ranked.

[11]Here, I analyze the shortening of /ej/ into /j/ as the glide-formation of the stem-final vowel plus the deletion of the auxiliary-initial glide. Alternatively, this could be analyzed as a coalescence. In the latter case, the relevant Faithfulness constraint can be UNIFORMITY, which penalizes a violation of the correspondence relation between the segmental units in the input and the output (McCarthy and Prince 1995).

(38)

/tabe + joo/	*V+V	*V+j	MAX$_{aux}$	DEP$_{aux}$(r)	ID(syllabic)
a. [*tabe-o'o]	*		*		
b. [*tabe-ro'o]			*	*	
c. [*tabe-jo'o]		*			
☞ d. [tabj-o'o]			*		*

Now, why does [r]-epenthesis instead of shortening occur when the stem is of a single mora? We can understand this fact as arising from exactly the same pressure that leads to *ra*-insertion in the negative inflection: shortening in the case of a single-mora stem would lead to a form that is too short to satisfy the intonational constraints. For this reason, shortening is avoided in a single-mora stem case, and [r]-epenthesis is chosen as the least costly repair for the violation of *V+j. Any relevant repair for the violation of *V+j violate either a phonotactic constraint such as *V+V, or an intonational constraint, each of which is assumed to outrank DEP$_{aux}$(r):

(39)

/de + joo/	*V+V	ACCENT=PENULT	INITRISE	*V+j	MAX$_{aux}$	DEP$_{aux}$(r)	ID(syllabic)
a. [*de-jo'o]				*			
b. [*dj-o'o]			*		*		*
c. [*dj-oo']		*			*		*
☞ d. [de-ro'o]					*	*	
e. [*de-o'o]	*				*		

In other words, since *V+j outranks MAX$_{aux}$ given the shortening phenomenon in the suffixation of *-joo* with non-monomoraic V-stems, the analysis of the Fukuoka morpho-phonology proposed in the previous section predicts that [r]-epenthesis should occur in the suffixation of *-joo* with monomoraic stems. This is exactly what we observe: Epenthesis of [r] arises instead of the shortening of a /V+j/ sequence only when the stem is monomoraic. In this sense, the [r]-epenthesis phenomenon of the hortative form provides a piece of support for the current analysis of *ra*-insertion in Fukuoka Japanese.

6   Implications on the general analysis of Japanese verbal inflection

In Section 2, we introduced the [r]-epenthesis analysis of Japanese verbal inflection, based on which the analysis of the Fukuoka verbal inflection is presented in the previous sections. In this section, we consider two alternative analyses for the Japanese verbal inflection in general, namely, the DELETION ANALYSIS and Ito and Mester's (2004) PARALLEL ANALYSIS. The deletion analysis assumes that the V-stem alternants of the suffixes as underlying, and derives the forms of the C-stem alternants by deleting the suffix-initial consonant, such as *r*. On the other hand, the parallel analysis assumes that both forms of the inflectional suffix are underlyingly available, and derives the form depending on the form of the stem based on the phonotactic constraints. After summarizing how the two analyses deal with the basic verbal inflection if Tokyo Japanese, I will discuss how the two analyses can be extended to the

[r]-epenthesis phenomena in Fukuoka Japanese. The conclusion will be that both analyses cannot be straightforwardly extended to deal with the phenomena in Fukuoka in a uniform fashion.

6.1   [r]-deletion analysis

The deletion analysis of Japanese verbal inflection states that the underlying form of the suffixes is the V-stem alternant, and deletes the initial consonant of the suffix when it attaches with a C-stem. Under this analysis, the pattern of suffixation except the negative form and the infinitive form can be easily accounted for by ranking *CODA and $\mathrm{DEP_{aff}}$ above $\mathrm{MAX_{aff}}$. This ranking leads to the deletion of the suffix-initial consonant as shown in the following tableau.

(40)

/watar + ru/	*CODA	$\mathrm{DEP_{aff}}$	$\mathrm{MAX_{aff}}$
a. [watar-ru]	*		
☞ b. [watar-u]			*
c. [watar-Vru]		*	

Just as in the case of the [r]-epenthesis analysis introduced in Section 2, the [r]-deletion analysis requires a special treatment of the negative and the infinitive forms. Otherwise, we would incorrectly predict deletion of the auxiliary-initial consonant in these forms, such as the *n* in *-nai*. By the assumption that the underlying forms are the alternants in the V-stem case, the underlying form of the negative suffix is *nai*. Applying the ranking in (40) to /watar + nai/ derives the incorrect form *[watar-ai]. In order to avoid this problem, we can assume that the suffixes are divided into two classes, and posit distinct faithfulness constraints for these classes. The classification of the suffixes are shown below.

(41)   **Class A**   *ru, reba, rare, joo, sase*

　　　 Class B   *nai, masu, tai*

Given this classification, we rank $\mathrm{DEP_A}$ above $\mathrm{MAX_A}$, but $\mathrm{DEP_B}$ below $\mathrm{MAX_B}$. Thus, $\mathrm{MAX_{aff}}$ and $\mathrm{DEP_{aff}}$ in (40) are replaced with $\mathrm{MAX_A}$ and $\mathrm{DEP_A}$ while the suffixation of *-nai* can be now correctly accounted for as in the following tableau.

(42)

/watar + nai/	*CODA	$\mathrm{MAX_B}$	$\mathrm{DEP_B}$
a. [watar-nai]	*		
b. [watar-ai]		*	
☞ c. [watar-anai]			*

Of course, one can ask if there is independent evidence for the classification in (41) as well as for the associated rankings of faithfulness constraints, especially because the kind of decompositional analysis presented for the [r]-epenthesis analysis appears to be difficult here. However, here we assume that the classification and the ranking discussed here are legitimate since this problem is independent of the problem that the *ra*-insertion phenomenon poses for the analysis. The argument I would like to pursue in the remainder of the section is that the

[r]-deletion analysis cannot straightforwardly capture the phenomena in Fukuoka Japanese even if it can fully account for the basic paradigm, as long as it assumes that the underlying form of a suffix is the V-stem alternant.

6.2   Parallel analysis

Another analysis of the Japanese verbal inflection, which I refer to as the parallel analysis, is proposed by Ito and Mester (2004), where both the C-stem alternants and the V-stem alternants of the suffixes are underlyingly available. In this analysis, any candidate that can be derived by combining a stem and one of the two allomorphs are considered in a single derivation. Thus, the indicative forms *mat-u* and *mi-ru* are derived as follows:

(43)   a.

/mat + {ru,u}/	*CODA	*V+V	DEP	MAX
☞ a. [mat-u]				
b. [mat-ru]	*			
c. [matV-ru]			*	
d. [ma∅-ru]				*

b.

/mi + {ru,u}/	*CODA	*V+V	DEP	MAX
☞ a. [mi-ru]				
b. [mi-u]		*		
c. [m∅-u]				*

In this analysis, the negative form and the infinitive form, which require a special treatment in both the [r]-epenthesis analysis and the [r]-deletion analysis, can be analyzed similarly without further assumptions, as shown in the following tableaux.

(44)   a.

/mat + {nai, anai}/	*CODA	*V+V	DEP	MAX
☞ a. [mat-anai]				
b. [mat-nai]	*			
c. [matV-nai]			*	
d. [ma∅-nai]				*

b.

/mi + {nai, anai}/	*CODA	*V+V	DEP	MAX
☞ a. [mi-nai]				
b. [mi-anai]		*		
c. [m∅-anai]				*

The crucial assumption here is that both allomorphs *-nai* and *-anai* are underlyingly available, so a simple suffixation of either can be a completely faithful candidate. This makes it possible for the analysis to do away with the kind of stipulation regarding the negative form and the infinitive form posited in the [r]-deletion analysis and the [r]-epenthesis analysis.

6.3 Discussion

[r]-deletion analysis How do these two alternative analyses deal with the [r]-epenthesis phenomena in Fukuoka? It turns out that the [r]-deletion analysis cannot straightforwardly account for the [r]-epenthesis both in the negative form and in the hortative form in a uniform way. To see this, let us first review the constraint ranking in the [r]-deletion analysis, and see how it can be extended to capture *ra*-insertion in negative inflection. The ranking is the following:

(45)   a. *CODA, *V+V, DEP$_A$ ≫ MAX$_A$
       b. *CODA, *V+V, MAX$_B$ ≫ DEP$_B$

The *ra*-insertion phenomenon in the negative inflection can be analyzed by positing ACCENT=PENULT and INITRISE above DEP$_B$. Just as in the analysis based on [r]-epenthesis discussed in the previous sections, this has the effect of favoring a candidate with *ra*-insertion to the candidates that are too short to satisfy both of the intonational constraints:

(46)

/ki + N/	*CODA	*V+V	ACCENT=PENULT	INITRISE	MAX$_B$	DEP$_B$
a. [ki'-N]				*		
b. [ki-a'N]		*				
☞ c. [ki-ra'N]						**

Also, in order to ensure that *ra*-insertion never occurs with the indicative form *-ru*, which is an A-class suffix, the analysis has to rank DEP$_A$ above INITRISE. This way, even though the form /ki-ru/ is of two morae, *ra*-insertion is not predicted, as illustrated below.

(47)

/ki + ru/	*CODA	*V+V	ACCENT=PENULT	DEP$_A$	INITRISE	MAX$_A$
☞ a. [ki'-ru]					*	
b. [ki-raru]				**		
c. [ki-aru]		*		*		

However, a problem arises with the ranking in (47) when we try to account for the [r]-epenthesis phenomenon in the hortative form *-joo*. Since *-joo* is an A-class suffix that undergoes deletion when it attaches to a C-stem, the ranking in (47) predicts that [r]-epenthesis should not be possible even if the form is too short to satisfy the intonational constraints. To see this, we first establish that *V+j outranks MAX$_A$ as seen by the shortening of /V+j/ into /j/ in the following tableau.

(48)

/tabe + joo/	*V+V	*V+j	DEP$_A$	MAX$_A$	ID(syllabic)
a. [*tabe-o'o]	*			*	
b. [*tabe-ro'o]			*	*	
c. [*tabe-jo'o]		*			
☞ d. [tabj-o'o]				*	*

Furthermore, DEP$_A$ outranks INITRISE given (47). This means that a form that is too short to satisfy INITRISE is predicted to be preferred over a form that avoids the violation of

InitRise using epenthesis. This is shown in the tableau in (50) based on the ranking in (49), which is one of the rankings consistent with all the pairwise rankings established so far.

(49) *V+V, Accent=Penult, Dep$_A$, *V+j $\gg$ Max$_A$, InitRise

(50)

/de + joo/	*V+V	Accent=Penult	Dep$_A$	*V+j	InitRise	Max$_A$	Id(syllabic)
a. [*de-jo'o]				*			
☞ b. [*dj-o'o]					*	*	*
c. [*dj-oo']		*				*	*
☺ d. [de-ro'o]			*			*	
e. [*de-o'o]	*					*	

As we can see from the tableau, the fact that Dep$_A$ outranks InitRise makes it impossible to account for [r]-epenthesis in the -*joo* suffixation in terms of the intonation and accent. The ranking in (49) incorrectly predicts that shortening applies even when the stem is of a single mora. It should be noted that the ranking in (49) is not the only one that is consistent with the pairwise ranking established up to this point, as InitRise could outrank *V+j. In such a case, the prediction is still that [r]-epenthesis is impossible since the candidate [de-roo] with [r]-epenthesis is dispreferred over both [de-joo] (with a *V+j violation) and [dj-o'o] (with an InitRise violation).

One possible way out for the [r]-deletion analysis is to divide each Dep constraint into Dep(r) and Dep(a), and rank Dep$_A$(a) above InitRise while ranking all of Dep$_B$(r), Dep$_B$(r) and Dep$_A$(a) below InitRise. This provides us with an account of the fact that [r]-epenthesis does not happen with -*ru* whereas it does with -*joo*. The account crucially utilizes the fact that the epenthesis in the -*ru* case would require the epenthesis of both [r] and [a] while that in the -*joo* case requires epenthesis of just [r]. Below, I illustrate this modification to the [r]-deletion analysis with two tableaux, the first of which shows the impossibility of *ra*-insertion with -*ru* and the latter of which shows the [r]-epenthesis with -*joo*.

(51)

/ki + ru/	*V+V	Acc=Penult	Dep$_A$(a)	InitRise	Dep$_A$(r)	Max$_A$
☞ a. [ki'-ru]				*		
b. [ki-raru]			*		*	
c. [ki-aru]	*		*			

(52)

/de + joo/	*V+V	Acc=Penult	Dep$_A$(a)	*V+j	InitRise	Dep$_A$(r)	Max$_A$	Id(syllabic)
a. [*de-jo'o]				*				
b. [*dj-o'o]					*		*	*
c. [*dj-oo']		*					*	*
☞ d. [de-ro'o]						*	*	
e. [*de-o'o]	*						*	

However, even with this modification, the analysis has the conceptual problem of losing the unified analysis of the [r]-epenthesis in the negative and the hortative form. Under the analysis, what derives the [r]-epenthesis in the negative form is the claim that both Dep$_B$(r) and Dep$_B$(a) are ranked below InitRise while what derives the [r]-epenthesis in

the hortative form is the claim that $\textsc{Dep}_A(r)$ is ranked below $\textsc{InitRise}$. The two claims are logically independent of each other, and it is an accident that Fukuoka Japanese happens to be the language that verifies these two claims. To put it in a different way, the analysis cannot predict the overall correlation between the presence of [r]-epenthesis in the negative and the hortative form in the dialects of Kyushu in general (National Institute for Japanese Language and Linguistics 1989–2006). Thus, I conclude that the [r]-deletion analysis cannot be extended to straightforwardly capture the [r]-epenthesis phenomena in Fukuoka in a uniform way.

Parallel analysis Next, let us turn to the parallel analysis. Importantly, in this analysis, the C-stem negative allomorph *-aN* in Fukuoka is underlyingly available in the derivation of the negative form of a V-stem verb. Thus, the analysis of *ra*-insertion based on the accent/intonation can be directly incorporated into the analysis, as shown in the following tableau.

(53)

/ki + {N, aN}/	*V+V	Max	Accent=Penult	InitRise	$\textsc{Dep}_{\text{aff}}(r)$
a. [ki-aN]	*				
☞ b. [ki-raN]					*
c. [ki'-N]				*	
d. [ki-N']			*		

Here, just as in the case of [r]-epenthesis analysis, $\textsc{Dep}_{\text{aff}}(r)$ is assumed to be lower than $\textsc{InitRise}$, deriving an [r]-epenthesis with a C-stem suffix *-aN* in cases where a normal suffixation with a V-stem suffix *-N* would lead to a violation of either $\textsc{Accent=Penult}$ or $\textsc{InitRise}$. Furthermore, it is correctly predicted in this analysis that a violation of $\textsc{InitRise}$ is tolerated and no *ra*-insertion is forced in the suffixation with *-ru*. This is because a violation of $\textsc{InitRise}$ cannot be resolved by a single epenthesis of [r] in such a form, and an extra epenthesis of a vowel is needed. This is shown in the following tableau.

(54)

/ki + {ru, u}/	*Dep(V)	Max	Accent=Penult	InitRise	$\textsc{Dep}_{\text{aff}}(r)$
a. [ki-rVru]	*				*
☞ b. [ki'-ru]				*	
c. [ki-ru']			*		

Epenthesis of [r] in the case of hortative form *-joo* can be accounted for as well:

(55)

/ki + {joo, oo}/	*V+j	*V+V	Max	Accent=Penult	InitRise	$\textsc{Dep}_{\text{aff}}(r)$
a. [ki-jo'o]	*				*	
b. [kj-o'o]			*	*		
☞ c. [ki-roo]						*

Thus, Ito and Mester's (2004) analysis is compatible with the current analysis of *ra*-insertion crucially because the C-stem alternant of the negative suffix *-aN* is underlyingly available for the derivation of the negative form of V-stem verbs. Nevertheless, their analysis suffers from the problem similar to that with the [r]-deletion analysis discussed above.

For them, the two [r]-epenthesis phenomena in Fukuoka and the suffixation of /r/-initial auxiliaries, such as *-ru* and *-reba* are derived in a totally different fashion. The former is derived by epenthesis of [r], as shown in the tableaux in (53) and (55). On the other hand, the suffixation of /r/-initial auxiliaries are derived just by a simple attachment of one of the underlying forms. In other words, Ito and Mester (2004) would need to add the mechanism of [r]-epenthesis in addition to what is already in the basic morpho-phonology to account for the phenomena in Fukuoka. As opposed to this, in the proposed analysis, the epenthesis of [r] is already assumed to exist in the basic system, and the phenomena in Fukuoka can be derived using this existing feature of the grammar, together with the accentual preferences specific to Fukuoka. Thus, from the parsimony point of view, we can argue that [r]-epenthesis analysis is more favorable than Ito and Mester's (2004) parallel analysis.

7 Conclusions and remaining problems

In this paper, I have presented two phenomena in Fukuoka Japanese involving epenthesis of [r] in the verbal inflection. One is the insertion of *ra* in the negative verbal inflection, and the other is the phenomenon in which the hortative suffix /-joo/ turns to [-roo]. Both of these phenomena arise only when the verbal stem is of a single mora, and this fact can be explained in terms of the accentual preferences in the dialect. More specifically, I have argued that the requirement for the Initial Rise, INITRISE, is ranked higher than $\text{DEP}_{\text{inf}}(r)$ in Japanese, causing the epenthesis of [r] to take place when the verbal complex is too short to satisfy INITRISE, together with the obligatory accent on the penultimate mora.

The proposed analysis is crucially based on the [r]-epenthesis analysis of Japanese verbal inflection. It is argued that the other possible analyses of Japanese verbal inflection, i.e., the [r]-deletion analysis and the Parallel analysis cannot uniformly analyze the two phenomena in Fukuoka, as well as the basic verbal inflection paradigm in Japanese. The basic reason for this is that the latter two analyses lack the mechanism of [r]-epenthesis, which is crucially required in the analysis of the phenomena in Fukuoka. In this sense, the analysis supports De Chene's (2010) argument for the existence of [r]-epenthesis in Japanese verbal inflection in general.

Needless to say, the current analysis leaves numerous questions unresolved, two of which I mention here. One problem is regarding the prediction the analysis makes for other dialects of Japanese. In the current analysis, there are at least three ways a dialect can vary: the contrastiveness of accent, the position of accent and the ranking of INITRISE. For example, if a dialect is contrastive for the presence of accent, but has the same system as Fukuoka elsewhere, the analysis predicts that the dialect has *ra*-insertion for the accented single-mora stem verbs, but not for unaccented verbs. I have to leave it for future research to investigate this kind of predictions concerning the dialectical variation.

Another problem is the phrasal status of INITRISE. After Pierrehumbert and Beckman (1988), the Initial Rise is considered to be a phrasal phenomenon rather than a lexical phenomenon. If this is also the case for the relevant constraint in Fukuoka Japanese, we predict the [r]-epenthesis in the negative and and hortative form *not* to occur in the phrase-

medial position. Again, I have to leave this as an open question whether this is empirically correct. The data strongly suggests that the [r]-epenthesis is possible in the verbs in isolation, but it is yet to be seen if its distribution is limited to certain environments in a phonological phrase.

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