Compensatory geminates in Japanese dialects[*]

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Abstract

The current study reviews Hayata's 1998 generative rule-based analysis and a plausible extension of Sasaki's 2013 OT analysis, which deals with a complex phenomenon of Hasaki-Ibaragi dialect of Japanese, with regard to explaining the former part of geminates at the final of the non-past forms of the /r/-final verbs in Takeo-Saga dialect of Japanese. Sasaki's 2013 ranking of Max[Place] and the markedness constraint *u#C (to prohibit the final vowel /u/ before the initial consonant of the syntactic head) incorrectly predicts for Takeo-Saga dialect that [siŋ gokiburi] does not surface for /sinu gokiburi/ 'a cockroach that will die'. In addition, Sasaki 2013 as well as Hayata 1998 cannot explain why consonant geminates occur, not capturing the phenomenon in the dialect as compensatory germinates. The phenomenon of Takeo-Saga-Japanese dialect fits Hayes' 1989 moraic theory in the framework of McCarthy's 2008 HS-OT better. Hayata's 1998 verb final /u/-deletion can be replaced with the more general markedness constraint *V*ru*, where /u/ or /ru/ is the non-past morpheme. 1) A markedness constraint, the prohibition of Prosodic Prominence on Expletives on the assumption that the allomorphs of the non-past tense are /u/, /ru/ and /u+ru/, and 2) the faithfulness constraint Ident[cons] are relevant to why consonant germinates occur. The adoption of Hayes 1989 makes it possible to explain the Japanese phenomenon along the compensatory lengthening and germinates of other languages like Lesbian and Thessalian dialects of Greek.

Contents

1   Methodology: Micro-comparative phonology

1. If theoretical linguistics is one of the cognitive sciences, aiming at explaining how children acquire the languages for a relatively short period of time by modeling the human language faculty, then what theoretical linguistics must explore is grammar in the scope of not only the target language or dialect but also its neighboring dialects and a standard language.

2. Children in country-side areas in Japan are exposed to 1) a native local language (or dialect), 2) its neighboring dialects and the standard language.

3. Any local dialect can be one of the neighboring dialects of another local dialect in Japan, for example, through family relationships.

4. Children in country-side areas in Japan acquire a native dialect and at least a few of other Japanese dialects and the standard Japanese, i.e., model grammar of the native dialect and at least a few of other Japanese dialects and the standard Japanese.

5. Dialectal differences, which may be minor or peripheral, may be crucial to have a deeper understanding of grammar of the target language or dialect extendable to those of its neighboring dialects and the standard language.[1]

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[1]This goal is distinct from that of dialectology or typology which usually deals with local languages (or dialects). Their purpose is to classify dialects and languages.

2 Phenomenon: the 'non-past' forms of the verbs in Takeo-Saga dialect

If its standard and Yanagawa-Fukuoka counterpart ends with /ru/

1. The 'non-past' form of every 1) so-called vowel /e/-final base verb and 2) strong base verb, necessarily ending with /ru/ in standard Japanese and Yanagawa-Fukuoka dialect, ends i) with the former part of the geminate consonant like [g] of [gg] if immediately followed by a noun beginning with a consonant (like /gohan/ 'rice') or ii) with the glottal stop sentence-finally.[2]

Table 1: The former part of a geminate at the final of the non-past forms in Takeo-Saga dialect of Japanese in contrast with standard Japanese and Yanagawa-Fukuoka dialect of Japanese

	S-final	RC#N	condi.	Neg. Imp.	caus.	
consonant /r/-final stem verbs						
Takeo	toʔ	tog (g...)	(torya:)	tonna	torasug (g...)	'take'
standard	toru	toru (g...)	toreba	toruna	toraseru (g...)	
Yanagawa	toru	toru (g...)	toreba	toruna	torasuru (g...)	
vowel /e/-final stem verbs						
Takeo	tabuʔ	tabug (g...)	(taburya:)	tabunna	tabesasug (g...)	'eat'
standard	taberu	taberu (d...)	tabereba	taberuna	tabesaseru (g...)	
Yanagawa	taburu	taburu (g...)	tabureba	taburuna	tabesasuru (g...)	
vowel /i/-final stem verbs						
Takeo	okiʔ	okig (g...)	(okirya:)	okinna	okisasug (g...)	'get up'
standard	okiru	okiru (g...)	okireba	okiruna	okisaseru (g...)	
Yanagawa	okiru	okiru (g...)	okireba	okiruna	okisasuru (g...)	
strong stem verbs						
Takeo	kuʔ	kug (g...)	(kurya:)	kunna	korasug (g...)	'come'
standard	kuru	kuru (g...)	kureba	kuruna	koraseru (g...)	
Yanagawa	kuru	kuru (g...)	kureba	kuruna	korasuru (g...)	
strong stem verbs						
Takeo	suʔ	sug (g...)	(surya:)	sunna	sasug (g...)	'do'
standard	suru	suru (g...)	sureba	suruna	saseru (g...)	
Yanagawa	suru	suru (g...)	sureba	suruna	sasuru (g...)	

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[2]Native speakers say that they pronounce the glottal stop as the former part of the geminate of [kitte] 'stamp'. Some kind of tension of the vocal folds is involved in the producing the sokuon in Tokyo dialect of Japanese according to Fujimoto's 2014 physiological study. At least the glottal constriction is involved where Hayata 1998 claims the glottal stop occurs.

If its standard and Yanagawa-Fukuoka counterpart does not end with /ru/

2. The 'non-past' form, not ending with /ru/ (or ending with /(w)u/, /tsu/, /mu/, /bu/, /nu/, /ku/, /gu/ or /su/) in standard Japanese and Yanagawa-Fukuoka dialect, never ends with the former part of a geminate consonant.

Table 2: The non-past forms in Takeo-Saga dialect of Japanese in contrast with standard Japanese and Yanagawa-Fukuoka dialect of Japanese: not the former part of geminate consonants

	S-final	RC#N	condi.	Neg. Imp.	caus.	
consonant /w/-final stem verbs						
Takeo	au	au (g...)	(aeba)	auna	awas<u>ug</u> (g...)	'meet'
standard	au	au (g...)	aeba	auna	awaseru (d...)	
Yanagawa	au	au (g...)	aeba	auna	awas<u>uru</u> (g...)	
consonant /t/-final stem verbs						
Takeo	matsu	matsu (g...)	(mateba)	matsuna	matas<u>ug</u> (g...)	'wait'
standard	matsu	matsu (g...)	mateba	matsuna	mataseru (g...)	
Yanagawa	matsu	matsu (g...)	mateba	matsuna	matas<u>uru</u> (g...)	
consonant /m/-final stem verbs						
Takeo	yomu	yomu (g...)	(yomeba)	yomuna	yomas<u>ug</u> (g...)	'read'
standard	yomu	yomu (g...)	yomeba	yomuna	yomaseru (g...)	
Yanagawa	yomu	yomu (g...)	yomeba	yomuna	yomas<u>uru</u> (g...)	
consonant /b/-final stem verbs						
Takeo	yobu	yobu (g...)	(yobya:)	yobuna	yobas<u>ug</u> (g...)	'call'
standard	yobu	yobu (g...)	yobeba	yobuna	yobaseru (g...)	
Yanagawa	yobu	yobu (g...)	yobeba	yobuna	yobas<u>uru</u> (g...)	
consonant /n/-final stem verbs						
Takeo	si<u>n</u>	si<u>n</u> (g...)	(sinya:)	si<u>n</u>na	sinas<u>ug</u> (g...)	'die'
standard	sinu	sinu (g...)	sineba	sinuna	sinaseru (g...)	
Yanagawa	sinu	sinu (g...)	sineba	sinuna	sinuas<u>uru</u> (g...)	
consonant /k/-final stem verbs						
Takeo	kaku	kaku (g...)	(kakya:)	kakuna	kakas<u>ug</u> (g...)	'write'
standard	kaku	kaku (g...)	kakeba	kakuna	kakaseru (g...)	
Yanagawa	kaku	kaku (g...)	kakeba	kakuna	kakas<u>uru</u> (g...)	
consonant /g/-final stem verbs						
Takeo	kagu	kagu (g...)	(kagya:)	kaguna	kagas<u>ug</u> (g...)	'meet'
standard	kagu	kagu (g...)	kageba	kaguna	kagaseru (g...)	
Yanagawa	kagu	kagu (g...)	kageba	kaguna	kagas<u>uru</u> (g...)	

3. The non-past morpheme alternates among:

1) [?] minus /r/ or the consonant $[C_i]$ as the first part of a geminate consonant $[C_i C_i]$ minus /r/ (in Takeo-Saga dialect), where the consonant C_i can be any consonant,

2) [?] or a consonant as the first part of a geminate consonant $[C_i C_i]$ (in Takeo-Saga dialect), where the consonant C_i can be any consonant,

3) [u] (in standard Japanese and Yanagawa dialect), and

4) [ru] (in standard Japanese and Yanagawa dialect).

3 Review of previous studies

3.1 Hayata's 1998 rule-based account

1. The underlying form of the glottal stop and the former part of geminate consonants is **/ru/, specifically 1) /...r+ru/ or 2) /-ru/**.[3]

  2. We argue for the stem final /r/ in 1). The stem final consonant /r/ occurs in the other verb forms of the negative, causative, passive and suggestive forms like [tor] of [toran], [torasuʔ] and [toraruʔ] and [toroi].[4]

  3. We argue for /u/ in 1) as at least an allomorph. The glottal stop only occurs when the tense of the verb is the non-past tense. The non-past morpheme /u/ occurs in the other stem-final consonants /w, m, b, t, k, g, s/ except for /r/ and /n/. See Table 2.

  4. We argue for 2). As the null hypothesis, Hayata 1998 assumes that the glottal stop in the other non-past forms, or those when the verb a vowel-final stem or a strong stem verb, is underlyingly /ru/. There is no fact that falsifies this assumption.

  5. Hayata's 1998 rules:

- Vowel change [1]: $e \rightarrow u / \text{\_\_\_}]_{verb\ stem}$
- Verb final /u/ absence [2]: $u \rightarrow \emptyset / r\text{\_\_\_}]_{verb}$
- /R/-regressive complete assimilation [3]: $r \rightarrow C_i / \text{\_\_\_}]_{verb}C_i$

  [1] The verb stem final /e/ changes to /u/.
  [2] The final /u/ of the non-past form is absent after the alveolar tap /r/.
  [3] The alveolar tap r, either the stem-final or the affix-initial, completely assimilates to whichever consonant immediately follows that.

  6.

ne ru toki	oki ru toki	UR
nuru toki		[1]
nur toki	okir toki	[2]
nut toki	okit toki	[3]
nuttoki	okittoki	

Table 3: Derivation of geminate consonants

  7. Hayata 1998 left a further study of the /r/ regressive assimilation, or the former part of geminate consonants/the glottal stop, for a future research,

  8. leaving a suggestion: 'It is as if some force were working that makes the number of the moras of each non-past form to be equivalent to that of the stem [plus one receiving the geminate consonant] (2-3) (brackets are mine).'

  9. We need some kind of moraic theory, as he noticed here and will be shown that moraic theory can explain Hayata's 1998 /r/ regressive assimilation.

3.2 Hayata's 1998 verb final /u/-deletion

1. In order to obtain a conspired aim in languages, Hayata's 1998 final /u/-deletion in *SPE* is replaced with the markedness constraint *V*ru* if /u/ or /ru/ is the non-past morpheme in the framework of Optimality Theory.

2. Optimality Theory: Surface forms, incurring the least serous violations of violable constraints in rankings of particular languages, are associated with underlying forms in Optimality Theory, which has emerged in 1993.

3. Raking of constraints, but not rule ordering, is in the foundation (Baković, Eric J. 2013).

4. Rules of sets, which cannot be broken into one general rule in each set in the rule-based theory, conspire to avoid one general pattern. This is one of the key intuitions behind the emergence of Optimality Theory.

5. V*r*V# - V*r*# in Isthmus Nahatul

Short unstressed vowels are present or absent synchronically in the environment of V(owel)[+voiced, +sonorant] __# in Isthmus Nahatul, spoken in Veracruz, Mexico (Kenstowicz and Kisseberth 1979: 298).

(1) a. sǐkakíli ∼ sǐkakíl 'put it in it'

    b. kítaya ∼ kítay 'he already sees it'

    c. kikówa ∼ kików 'he buys it'

    d. támi ∼ tám 'it ends'

6. Rule: $V \rightarrow \emptyset$ / V*r*___# (Kenstowicz and Kisseberth 1979: 299)

7. V*ri*# - V*i*# in Saga dialects in general

The alveolar tap is absent between a vowel and /i/ in Saga dialects generally.

(2) a. ari ∼ ai 'aunt'

    b. iri ∼ ii 'parch'

    c. uri ∼ ui 'melon'

    d. ori ∼ oi 'cage'

8. Rule: $r \rightarrow \emptyset$ / V___*i*, where this applies to words of not a tensed verb.

9. No relationship will be discovered if we see the three rules (5-[2] in 3.1, 7 and 5) without abstracting what these rules aim at in the framework of OT.

(3) a. $u \rightarrow \emptyset$ / r___$]_{verb}$ [Saga]

    b. $r \rightarrow \emptyset$ / V___*i*   [Saga]

    c. $V \rightarrow \emptyset$ / V*r*___#   [Isthmus Nahatul]

10. Seeing the target and context of each of the three rules, it will turn out that Takeo-Saga dialect of Japanese avoids the sequences of the patterns:

(4) a. *V*ru*, or *V $\begin{bmatrix} +son \\ cor \\ -nas \end{bmatrix} \begin{bmatrix} +high \\ +back \end{bmatrix}$, if the final /ru/ or /u/ is the non-past morpheme,

    [Saga] and

b. *V*ri*, or *V $\begin{bmatrix} +son \\ cor \\ -nas \end{bmatrix}$ $\begin{bmatrix} +high \\ -back \end{bmatrix}$ [Saga]

Correspondingly, languages use particular repairs respecting constraints. Takeo-Saga dialect repairs the sequences of the pattern (4a) by the final vowel absence, or:

(5) V*r*, or V $\begin{bmatrix} +son \\ cor \\ -nas \end{bmatrix}$, and   [Saga]

the sequences of the pattern (4b) by the intervocalic alveolar tap absence, or:

(6) V*i*, or V $\begin{bmatrix} +high \\ -back \end{bmatrix}$.   [Saga]

11. Isthmul Nahatul repairs the sequences of the pattern (7a) by the final vowel absence, or (7b) to avoid that pattern.

(7) a. *V[+*son*]V#   [Isthmul Nahatul]
     b. V[+*son*]#

3.3   Hayata's 1998 vowel sound change of /e/ to /u/

1. This section is from Koga ms.

2. We may be tempted to analyze **the stem final /e/ → /u/** as **that of the old Japanese potential verb /e/**. (Hayata's rule can be considered as such an analysis as this).

'non-past'	prenominal	'past'	'neg'	'causative'
<u>u</u>	<u>uru</u> toki	<u>e</u>ta	<u>e</u>nu	<u>e</u>sase
tab<u>u</u>	tab<u>uru</u> toki	tab<u>e</u>ta	tab<u>e</u>nu	tab<u>e</u>sase

Table 4: The verb forms of /e/ 'obtain' or 'can' in Old Japanese

'non-past'	prenominal	'past'	'neg'	'causative'
<u>e</u>	<u>eru</u> toki	<u>e</u>ta	<u>e</u>nai	<u>e</u>sase
tab<u>eru</u>	tab<u>eru</u> toki	tab<u>e</u>ta	tab<u>e</u>nu	tab<u>e</u>sase

Table 5: The verb forms of /e/ 'obtain' or 'can' in modern Japanese

3. Problems: The intermediary /u/ will occur even if the lexeme is not associated with a vowel /e/-stem final verb.

- For example, /sinu/ 'die' and /sin/, but */sine/ in the stems of the /n/-final base verbs in Yamaguchi dialect.

- For example, /oku/ 'get up' and /oki/, but */oke/ in the stems of the vowel /i/-final base verbs with the stem heavier than one mora in Old Japanese.

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Table 6: Verb stems in all the various verb forms

m-class	language	Non-past	Non-past*/Conditional	Past	Imperative	Neg	Voice
C-final			uk	uk	uk	uk	uk
			...				
/n/-final	Yamaguchi		sin	sin	sin	sin	sin
	Yamaguchi		...				
	Old Japanese	sin	sin	sin	sin	sin	sin
	Old Japanese	...					
/e/-final	western Saga		n	ne	ne	ne	ne
	western Saga		...				
	western Saga		tab	tabe	tabe	tabe	tabe
	western Saga		...				
	Old Japanese	n	n	ne	ne	ne	ne
	Old Japanese	tab	tab	tabe	tabe	tabe	tabe
	Old Japanese	...					
/i/-final			ki	ki	ki	ki	ki
			...				
	Old Japanese	ok	ok	oki	oki	oki	oki
	Old Japanese	...					
strong			k	k	k	ko	ko
	western Saga		s	s	se	se	se/s
	Old Japanese	k	k	k	k	ko	ko
	Old Japanese	s	s	s	se	se	se/s

Non-past means sentence-final 'non-past' forms. Non-past* means prenominal 'non-past' forms.

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- For example, /ku/ 'come', /ko/ and, possibly /k/, but */ke/ in the stems of the strong base verbs in standard Japanese, western Saga dialect and Old Japanese.

4. If **the vowel /u/ replacing the stem final /e/ (and the stem final /i/ in old Japanese)** were analyzed as a **part of another stem**, then this would apply to the **/n/ consonant-final verbs in Yamaguchi dialect**, and so /sinu/ would be another stem. This is strange.

5. Those **stems** without /ru/ added like /tabu/ 'eat-Non-past' were used **as the 'non-past' forms** in old Japanese.

6. The vowel /u/ that immediately precedes a geminate consonant in western Saga dialect is a part of the 'non-past' affix. We also use this for Takeo-Saga dialect.

7. The stems of the vowel /e/-final base verbs and the strong base verbs include those with the final /u/ absent like /n/ 'sleep', /tab/ 'eat', /k/ 'come' and /s/ 'do'.

3.4 An extension of Sasaki's 2013 Optimality Theoretic account

1. Sasaki 2013 deals with a complex phenomenon of Hasaki-Ibaragi dialect of Japanese including the *V*ru* plus the /r/ complete assimilation.[5]

2. Sasaki's 2013 constraints relevant to the consonant geminates in Takeo-Saga dialect are:

(8) a. The faithfulness constraint Max[Place] prohibits the elimination of any POA feature value, where the POA feature of the alveolar tap of Japanese and the dialect is underspecified.

   b. The markedness constraint Coda Condition (Ito and Mester 1993) bans the singleton non-nasal consonant in the coda position.

   c. The markedness constraint *u#C prohibits /u/ before the particle [head]-initial consonant' [brackets are mine].

   d. Ranking: Max[Place] ≫ CodaCond ≫ *u#C

3. Sasaki's 2013 markedness constraint *u#C is different from the markedness constraint *V*ru*.

4. The constraint *u#C prohibits the sequence whichever consonant precedes the vowel /u/, not only /r/ but also any of the other consonants, e.g., /...mu/#/d.../.

5. The POA of /r/ is underspecified; the POA of [d] is cor(onal); the POA of [k] is velar.

Tableau 7: Sasaki' 2013 predictions of consonant geminates: 1

		Max[Place]	CodaCond	*u#C
	UR: /kuru#daigaku/ 'come [Non-past]-university'			
	a. kuru#d...			*
	b. kur#d...		*	
☞	c. kud#d...			
	UR: /kaku#daigaku/ 'write [Non-past]-university'			
☞	a. kaku#d...			*
	b. kak#d...		*	
	c. kad#d...	*		

6. The markedness constraint Max[Place] is responsible for preventing any underlying consonant which has a specific value for the POA feature from being absent and allowing any consonant which does not have a value for the POA feature to be absent.

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[5] The core phenomenon of Sasaki 2013 is the avoidance of voiced consonant geminates, or *[+voiced][+voiced].

7. This interaction between the two constraints of *u#C and Max[Place] makes an incorrect prediction for Takeo-Saga dialect.

Tableau 8: Sasaki' 2013 predictions of consonant geminates: 2

		Max[Place]	CodaCond	*u#C
UR: /sinu#gokkabui/ 'die [Non-past]-cockroach'				
⊥	a. sinu#g...			*
	b. sin#g...		*	
☞	c. siŋ#g...	*		

8. The constraint *V*ru* thus explains the consonant geminates in Takeo-Saga dialect better than the working together of Max[Place] and *u#C.

9. Sasaki 2013 attempts to account for 1) consonant geminates in some past forms occurring over stems like /tor/ 'take' and the affix /ta/ 'Past' and 2) the consonant geminates occurring over the non-past forms, but NOT stems, and the syntactic head like a head noun at the same time.

10. The former are inflectional and the latter are syntactic like a comp-head phrase or an adjunct head phrase, and so, the relevant constraints with a particular ranking for the former are different from those for the latter (although some, but not all, may be common.)

11. Sasaki 2013 does not explain why the consonant geminates occur where the final /ru/ is absent although he uses Coda Condition, which is supposed to assume some kind of moraic theory.

12. Sasaki's 2013 idea to use OT to explain the occurrences of consonant geminates at the final of the non-past forms in dialects of Japanese is valid.

13. As OT explains dialectal differences by different rankings of constraints, it can also explain the consonant geminates in dialects of Japanese by different rankings of the same constraints, as will be shown later.

4 Proposal

4.1 Allomorphs of verb stems and allomorphs of the non-past affix

1. The tense expletive, either /u/ or /ru/, selects itself (as well as verb stems), and the whole is another tense expletive (Koga ms).

2. That is, the tense expletive may be such a complex as [$_{tense}$ [$_{tense}$ u] [$_{tense}$ ru]]. For example, the complex [$_{tense}$ [$_{tense}$ u] [$_{tense}$ ru]] selects the verb stem /n/ 'sleep' in Figure 2 and /k/ 'come' in Figure 4 as well as the simple morphemes [$_{tense}$ u] and [$_{tense}$ ru] select verb stems, as the former does in Figure 1 and the latter does in Figure 3.

UR: T[*expl*]
           / \
    V[*bse*]   T[*expl*]
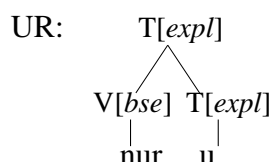 | |
      nur   u

Figure 1: The 'non-past' form /nur#u/ 'paint-Non-past'

3. If the verb stem is a consonant-final base verb, the morpho-syntactic structure of its 'non-past' form and the tense morpheme will be the same as that in Figure 1. If the verb stem is a vowel
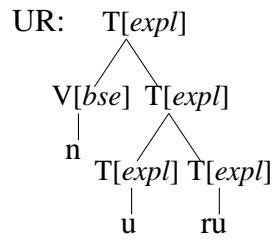
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UR: T[*expl*]

V[*bse*] T[*expl*]
|
n   T[*expl*] T[*expl*]
| |
u   ru

Figure 2: The 'non-past' form /n#u#ru/ 'sleep-Non-past'

UR: T[*expl*]

V[*bse*] T[*expl*]
| |
ki   ru
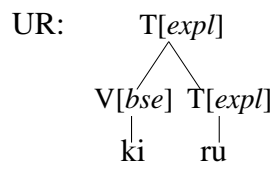
Figure 3: The 'non-past' form /ki#ru/ 'wear-Non-past'

UR: T[*expl*]

V[*bse*] T[*expl*]
|
k   T[*expl*] T[*expl*]
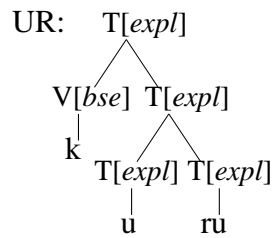| |
u   ru

Figure 4: The 'non-past' form /k#u#ru/ 'come-Non-past'

/e/-final base verb or a strong base verb, then it will be the same as that in Figures 2 and 4. If the verb stem is a vowel /i/-final base verb, it will be the same as that in Figure 3.

4.2 Hayes' 1989 moraic theory and the markedness constraint *V*ru*

1. Adopting Hayes 1989 and Ito's 1986 prosodic licensing of segments, the 'non-past' forms of /n#u#ru/ 'sleep-Non-past' and /nur#u/ 'paint-Non-past', for example, are required to be prosodically licensed, and are prosodically licensed to be given such a syllabic and moraic structure as in Figure 5.

$$\sigma \quad \sigma$$
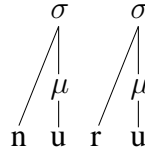$$\mu \quad \mu$$
$$n \quad u \quad r \quad u$$

Figure 5: The syllabic and moraic structure of /nuru/ 'sleep-Non-past' and 'paint-Non-past'

    2. Segments are syllabified into a sequence of nuclei with zero-to-two consonants at its onset of each and zero-to-one special consonant at its coda.
    3. Markedness constraint *V*ru*

(9) Markedness constraint: The sequence of 1) a vowel, 2) the sonorant coronal segment (the alveolar tap or the dental nasal) and 3) [+ high, + back] vowel is not appropriate at the final of the tense expletive form (or the form with [$_{tense}$ TFORM *expl*]). (Koga ms.)

    3. We do not discuss what kind of constraints are relevant and how they determine the repair of the sequences of the pattern of 1) a vowel, 2) the sonorant coronal segment (the alveolar tap or the dental nasal) and 3) [+ high, + back], where the final /ru/ or /u/ is the tense expletive form (or the form with [$_{tense}$ TFORM *expl*]). The repair is by the final vowel absence. We leave this for a future study.
    4. For example, the 'non-past' forms of /nur#u/ 'paint-Non-past' and /n#u#ru/ 'sleep-Non-past' with the given structure will be associated with the same except for the high back vowel absent, or that in Figure 6.

$$\sigma \quad \sigma$$
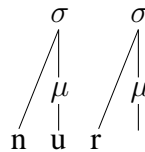$$\mu \quad \mu$$
$$n \quad u \quad r$$

Figure 6: The final vowel absence after [coronal, +sonorant] of [Tense Expletive]

    5. A syllable structure is absent when the syllable contains no overt nuclear segment (as Hayes 1989 presented as parasitic delinking).
    6. In contrast, moras are preserved by the faithfulness constraint Max-μ, as defined in (10).
    7.

(10) Prosodic faithfulness constraint, Max-μ: Assign one violation for each mora in the input that is not present in the output.

    8. Any stranded mora optionally acquires a new association with an adjacent syllable through the always-available syllabifications, as exemplified through the associations in the 'non-past' forms of /n#u#ru/ 'sleep-Non-past' between that in Figure 7 and that in Figure 8.
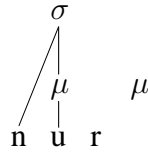
$$\sigma$$

$$\mu \qquad \mu$$

$$n \quad u \quad r$$

Figure 7: The absence of the syllable structure due to the nucleus absence and mora preservation

$$\sigma$$

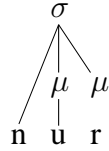$$\mu \quad \mu$$

$$n \quad u \quad r$$

Figure 8: Syllabification: linking the stray mora to the preceding vowel melody

9. The intermediary forms are postulated, which is allowed in HS-OT in OT, between the underlying forms and the phonetic realizations, as given in Table 9.

Table 9: The intermediary forms of the non-past forms with the underlying final /ru/

[m-class]	meaning	Intermediary Forms	Saga Takeo dialect
C-final	'sell'	ur dzikan	u<u>d</u> dzikan
	'knead'	ner dzikan	ne<u>d</u> dzikan
	'cut'	kir dzikan	ki<u>d</u> dzikan
	'paint'	nur dzikan	nu<u>d</u> dzikan
	'open [pages]'	kur dzikan	ku<u>d</u> dzikan
	'rub'	sur dzikan	su<u>d</u> dzikan
/e/-final	'sleep'	n#u#r dzikan	nu<u>d</u> dzikan
	'eat'	tab#u#r dzikan	tabu<u>d</u> dzikan
/i/-final	'wear'	ki#r dzikan	ki<u>d</u> dzikan
	'wake'	oki#r dzikan	oki<u>d</u> dzikan
strong	'come'	k#u#r dzikan	ku<u>d</u> dzikan
	'do'	s#u#r dzikan	su<u>d</u> dzikan

4.3 McCarthy's 2008 Coda Condition

1. McCarthy's 2008 CodaCond, as given in (11), disallows, for example, the association of the 'non-past' forms with the syllabic and moraic structure of Figure 8 with the same except for the alveolar tap linked to the coda mora of Figure 9.

(11) CodaCond: Assign one violation mark for every token of Place [of the consonant at the coda] that is not associated with a segment in the syllable onset. (McCarthy 2008: 279).

2.

3. The consonant at the onset of the next syllable can be any consonant as exemplified in [nug gogo] 'paint/sleep-Non-past-afternoon', which is interpreted as meaning 'the afternoon when (he) sleeps/paints it'.
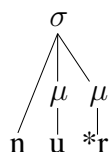
$$\sigma$$

Figure 9: *r at the coda

4. There is no sharing of the POA feature between the alveolar tap and the velar /g/, for example. There will be no other way to let the alveolar tap absent, leaving the mora alone stranded at the coda, as in Figure 10.
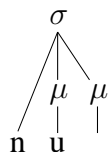
Figure 10: A mora associated with no segment

5. Hayes' 1989 moraic theory correctly predicts there are two theoretically possible ways to have the mora at the coda filled by a segment for a compensation: one, the lengthened vowel, what is called 'compensatory lengthening', and two, the consonant geminate.

- Compensatorily Lengthened Vowel (CL): The consonant at the onset of the next syllable is prepared and audible, or having a geminate, at the coda, as in the rest in Figure 11.

- Compensatory Consonant Geminate (CG): The vowel at the nucleus is lengthened and audible at the coda, as in some in Figure 12.

6. Particular languages actually use either compensatory lengthening or compensatory geminates or both, Kiparsky 2011 calls a 'realization problem'.
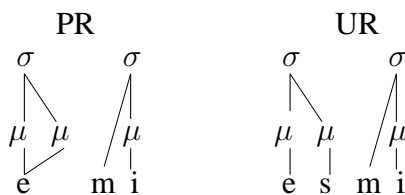
7. Greek dialects:

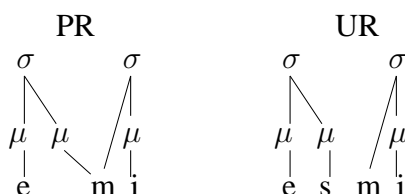Figure 11: CL in Attic ([e:mi] 'I am')

Figure 12: CG in Lesbian and Thessalian ([emmi] 'I am')

8. Takeo Saga dialect as well as Lesbian and Thessalian Greek use only consonant geminates, as exemplified in Figures 13 and 14.
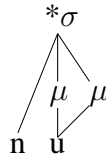
$*\sigma$

n u

Figure 13: No lengthened vowel for the compensation in Takeo-Saga dialect
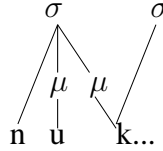
σ σ

n u   k...

Figure 14: Consonant geminate for the compensation in Takeo-Saga dialect

cf. Western Saga dialect as well as Tiberian Hebrew use both.

9. These are predicted by the constraints on the particular ranking.

10. Thus, Hayes' 1989 moraic theory explains why the consonant geminates occur in conjunction with McCarthy's 2008 CodaCond, pointing out that the consonant geminates in Takeo-Saga dialect of Japanese as compensatory geminates or lengthening. See Poser 1986 for compensatory geminates in Japanese.

4.4 McCarthy's 2008 Harmonic Serialism-OT and Ident[cons] and *ProsPromExpl

4.4.1 McCarthy's 2008 Harmonic Serialism-OT

1. HS-OT is a version of Optimality Theory.

2. It allows intermediate forms. See Tanaka 2013 for its application to solve the opacity in the past forms of Japanese in case that the verb is a consonant stem verb.

4.4.2 Faithfulness constraint: Ident[cons]

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1. We propose a different ranking of the faithfulness constraint Ident[cons(onantal)] for Takeo Saga dialect from that for western Saga dialect.

(12) Faithfulness constraint: Ident[cons(onantal)]: Assign one violation mark for every segment that changes its value for the feature consonantal between the input and output.

2. Takeo-Saga dialect cares the consonantal feature, and does not allow, for example, an underlying consonant to be associated with a vowel as a phonetic realization.

3. The constraint of the faithfulness of the consonantal feature, as given in (12), between the constraint of Prohibition of Prosodic Prominence on Expletive and the constraint of Max[Place], or

(13) Ranking of the faithfulness constraint, Ident[cons(onantal)]:
    *ProsPromExpl ≫ Ident[cons] ≫ Max[Place].

4.4.3 Markedness constraint: Prohibition of Prosodic Prominence on Expletive (Koga ms.)

4. The tense expletive forms of verbs with verb stems, e.g., /tab/ 'eat', /n/ 'sleep', have the morpheme of the tense expletive doubled to have [$_{tense}$ [$_{tense}$ *u*] [$_{tense}$ *ru*]] in morpho-syntax.

  5. See Koga and Ono 2010 for the reason for why the tense expletive will be doubled if the verb stem is a vowel /e/-final base verb or a strong base verb in Saga Takeo dialect as well as western Saga dialect. The prosodic minimality is relevant.

  6. Koga ms. proposes (14) to prevent the vowel of the phoneme /u/, which is the tense expletive or a part of the tense expletive from being lengthened like [tabuu] for UR /taburu/.

(14) Markedness constraint: *ProsPromExpl: There is no prosodic prominence (e.g., vowel lengthening for Japanese, stress for English) on any expletive form.

  7.

(15) a. *Thére is a man walking on the roof.
      b. There is a mán walking on the roof.
      c. There is a man wálking on the roof.
      d. There is a man walking on the róof.

  8. Koga ms. adopts Kiparsky's 2011 Super-Optimality for western Saga dialect, but the markedness constraint is ranked in a much lower position for Takeo-Saga dialect.

4.4.4 Ranking of violable faithfulness and markedness constraints

9.

(16) Max-$\mu \gg$ CodaCond $\gg$ HavePlace $\gg$ *ProsPromExpl $\gg$ Ident[cons] $\gg$ {Max[Place], Max-V,C, Dep-V,C}

  10. The ranking of *ProsPromExpl $\gg$ Ident[cons] $\gg$ Max[Place], in which the markedness constraint Ident[cons] is ranked at a higher position, explains the CG phenomenon in Takeo-Saga dialect. All in the grammar of western Saga dialect that differs from the grammar of Takeo-Saga dialect is that *ProsPromExpl $\gg$ S-Opt $\gg$ Ident[cons].

4.5 Predictions

1. The core components of morphology and syntax 'generate', for example, /n#u#ru/ '(He) will sleep', /tab#u#ru/ '(He) will eat (it)', /oki#ru/ '(He) will get up' and /nur#u/ '(He) will paint (it)' as a tensed phrase (TP), and /tab#u#ru/ # /gohan/ as a noun with a relative (finite) clause adjoined ([$_N$ [$_T$ $_N$]], Figure 15).

N
T (Relative Clause)   N
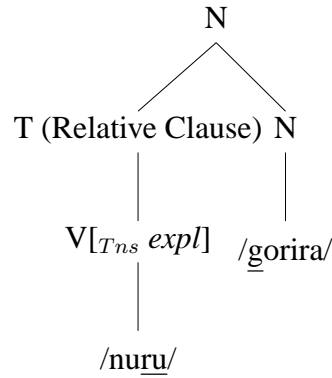V[$_{Tns}$ *expl*]   /g̲orira/
/nur̲u̲/

Figure 15: The syntactic structure of /nuru/ # /gorira/ 'gorilla which sleeps'

2. Harmonic Serialism in OT with the markedness and faithfulness constraints and the proposed rankings makes such correct predictions that:

- 1) the intermediary form nur 'paint [Non-past]', whose morpheme boundaries are nur, as its UR will be given in the upper part of Tableau 10, is associated with [nuk] (kodomo),

- 2) the intermediary form nur 'sleep [Non-past]', whose morpheme boundaries are n#u#r, as its UR will be given in the upper part of Tableau 11, is associated with [nuk] (kodomo),

4.5.1 Regarding nur 'paint [Non-past]', in which there is no morpheme boundary:

3. The candidate set of the intermediary form nur, which won at the first stage, may contain, for example, nur and nuH.

4. CodaCond and HavePlace, outranking Max[Place] and Max-V,C, associate the form nur with one with the coda consonant /r/ replaced with its Placeless counterpart H, as in the second step of Tableau 10

5. The form nuH wins in the second step.

6. The candidate set in the third step may contain nuH, nu, nu: and nuk, as given in the second pass of Tableau 10.[6]

7. The form nu: does not violate Prohibition of Prosodic Prominence on Expletive (*ProsProm-Expl) since the vowel at the nucleus is a part of the verb stem, and is not associated with the tense expletive.

8. However, it violates Ident[cons] since the consonantal feature at the final of the input nur is not at the final of the output nu:. The vowel /u/ of nu: is not consonantal and the alveolar tap /r/ is consonantal.

9. The form nuk (kodomo) does not violate *ProsPromExpl or Ident[cons]. For the former, it is because there is no vowel lengthening at the final. For the latter, the final /k/ is a consonant as the alveolar tap /r/ is, and has Ident[cons] not violated.

10. The form nuk (kodomo) is the least serious violations of the violable constraints, and so optimal for nur 'paint [Non-past]' (kodomo).[7]

11. The phonetic realization [nuk (kodomo)] 'children who paint (it)' is predicted to be interpreted as meaning that the children who paint it.

.

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[6]The vertical lines between Max[Place] and Max-C and between Max-C and Dep-C,V should be actually dotted lines, for which the current tableau uses no line.

[7]Ident [nasal] is not included as a constraint to prevent [nun] from being associated with /nuru/. Ident [nasal] is ranked higher, whereas Ident[nasal] is ranked at a lower position in Okinawa dialect. Okinawa dialect allows the nasal sound N to be associated with /ru/ even if there is no nasality, as in [iN-nu aN] '(we) have some relationship' with its UR /en-nu aru/.

Tableau 10: Harmonic improvements of IR nur of UR /nur#u/ 'paint-Non-past'

		Max-μ	CodaCond	HavePlace	*ProsPromExpl	Ident[cons]	Max[Place]	Max-C	Dep-C,V
	Step 2: nur # kodomo UF: T[*expl*] MS of IR: σ with μ μ → n u r V[*bse*] T[*expl*] nur u								
	a. nur # kodomo			*!					
☞	b. nuH # kodomo				*			*	*
	Step 3: nuH # kodomo								
	a. nuH # kodomo				*!			*	*
	b. nu # kodomo	*!					*	*	*
	c. nu: # kodomo						*!	*	*	*
☞	d. nuk # kodomo							*	*	*

4.5.2 Regarding nur (n#u#r) 'sleep [Non-past]':

12. The prediction regarding the form nur (n#u#r) 'sleep [Non-past]' is the same up to the stage where the form nuH wins.

13. We are now in the third pass, which will be given in Tableau 11.[8]

14. The candidate set of the intermediary form nuH, which has won in the second stage, may contain nuH, nu, nu: and nuk (kodomo).

15. The form nuH violates HavePlace.

16. The form nu violates Max-μ.

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[8]The vertical lines between Max[Place] and Max-C and between Max-C and Dep-C,V should be actually dotted lines, for which the current tableau uses no line.

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Tableau 11: Harmonic improvements of IR nur of UR /n#u#ru/ 'sleep-Non-past'

	Max-μ	CodaCond	HavePlace	*ProsPromExpl	Ident[cons]	Max[Place]	Max-C	Dep-C,V

Step 2: nur # kodomo

MS of IR:
σ
μ μ
n u r

UF: T[*expl*]
V[*bse*] T[*expl*]
n
T[*expl*] T[*expl*]
u ru

		Max-μ	CodaCond	HavePlace	*ProsPromExpl	Ident[cons]	Max[Place]	Max-C	Dep-C,V
	a. nur # kodomo				*!				
☞	b. nuH # kodomo				*			*	*

Step 3: nuH # kodomo

		Max-μ	CodaCond	HavePlace	*ProsPromExpl	Ident[cons]	Max[Place]	Max-C	Dep-C,V
	a. nuH # kodomo				*!			*	*
	b. nu # kodomo	*!				*	*	*	
	c. nu: # kodomo				*!	*	*	*	*
☞	d. nuk # kodomo						*	*	*

b. nu # kodomo:
σ σ
μ
n u # t ......

c. nu: # kodomo:
σ σ
μ μ
n u # t ......

d. nuk # kodomo:
σ σ
μ μ
n u # t ......

17. The form nu: or nuk does not violate Max-μ since the mora is associated with the vowel by lengthening in the first, with the onset consonant of the next syllable in the second.

18. The form nu: for 'sleep-Non-past' violates *ProsPromExpl since the tense expletive form /u/ is phonologically lengthened as well as violates Ident[cons].

19. Note that the form nu: for 'paint-Non-past' does not violate *ProsPromExpl since the phoneme /u/ is a part of the stem, and yet violates Ident[cons].

20. The difference in the degree of seriousness of violations explain the appropriateness between nu: for 'paint-Non-past' and nu: for 'sleep-Non-past'. The former sounds better than the latter in western Saga dialect.

21. The form nuk (kodomo) wins.

22. That is, the form [nuk (kodomo)] is interpreted as meaning this as well as meaning that the hour when children who paint (it), as we saw previously.

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