

C-2

Affix Allomorphy Determined by Uniformity of Paradigmatic Prosodic Patterns

Hiroki Koga
Saga University

Abstract

The current study will explain part of affix allomorphy selection posed by Koga and Ono's (2010) proposal of another affix allomorph /uru/ in Ariake western Saga dialect of Japanese. The uniformity of paradigmatic patterns determines which well-formed inflectional pattern of the forms in morphology is well-formed in phonology, which is an instantiation of the cases in which prosody/phonology impinges on morphology (or $P \gg M$) (McCarthy and Prince 1993).

Keywords: Ariake western Saga dialect, affix allomorphy, prosodic morphology, uniformity of paradigmatic patterns

Tableau 1: $*[\sigma\text{-CCV}, \text{CODA}\text{COND}, *[\sigma\text{-V}]$

		$*[\sigma\text{-CCV}]$	CODACOND	$*[\sigma\text{-V}]$
/tob+{u, ru}/ 'fly-Non-past'				
☞	a. to.bu			
	b. to.bru	*!		
	c. tob _μ .ru		*!	
/oki+{u, ru}/ 'get up-Non-past'				
☞	a. o.ki.ru			
	b. o.ki.u			*!

The affix allomorphy selection in the non-past forms of the Tokyo Japanese is determined by the phonological property of the stem final segment. It is explained by the constraints 1) ONSET (or $*[\sigma\text{-V}]$ and 2) *either* CODACOND (or $*[\text{Place } \alpha].[\text{Place } \beta]$) if the stem final consonant is underlyingly associated with a mora (Hall et al. 2018) *or* $*\text{COMPLEXONSET}$ (or $*[\sigma\text{-CCV}]$) if the stem final consonant is underlyingly associated with no mora in OT, as in Tableau 1.

Koga (2015) argued that the non-past affix of Saga western Ariake dialect of Japanese is associated with allomorphs not only /(r)u/ but also /uru/ because the palatal semivowel occurs if the segment immediately preceding the affix allomorph /uru/ is underlyingly a vowel like /obo-j-uru/ 'remember' in parallel with that in the potential forms like /oboe-j-uru/

'remember [present participle]-can'. This proposal poses a problem of affix allomorphy selection regarding with which the consonant-final stem allomorph pairs between the two vowel-initial affix allomorphs /u/ and /uru/ for (i) the two allomorph stem verbs /k+uru/ 'come-Non-past' vs. $*k+u$ /, /s+uru/ 'do-Non-past' vs. $*s+u$ /, as in the middle of table 2, and for example, /tab+uru/ 'eat-Non-past' vs. $*tab+u$ /, /n+uru/ 'go to bed-Non-past' vs. $*n+u$ /, as in the upper part of the table, and for (ii) one-allomorph stem verbs, for example, /tir+u/ 'scatter-Non-past' vs. $*tir+uru$ /, as in the lower part of the table.

The given constraints for the Tokyo dialects can explain other forms with the consonant final stem allomorphs affixed with the consonant initial affix allomorphs /ru/ like $*tab+ru$ /, $*k+ru$ /, $*tob+ru$ / and other

Table 2: Morpho-syntactically well-formed non-past forms

Stem	Affix	Non-past forms	Misc.
X(e)	uru	taburu, nuru, ...	-
tab(e), n(e), ...	u	$*tabu$, $*nu$, ...	Not yet solved
k(o), s(e)	uru	kuru, suru	-
	u	$*ku$, $*su$	Prosodic Minimality
C-final	u	toru, tobu, ...	-
tor, tob, ...	uru	$*toruru$, $*toburu$, ...	Not yet solved

forms with vowel-final stem allomorph affixed with the vowel-initial affix allomorph /uru/ like */oki+uru/. The one-consonant allomorphs /k/ and /s/ affixed with the shorter affix allomorph /u/ violate Prosodic Minimality (Koga and Ono 2010).

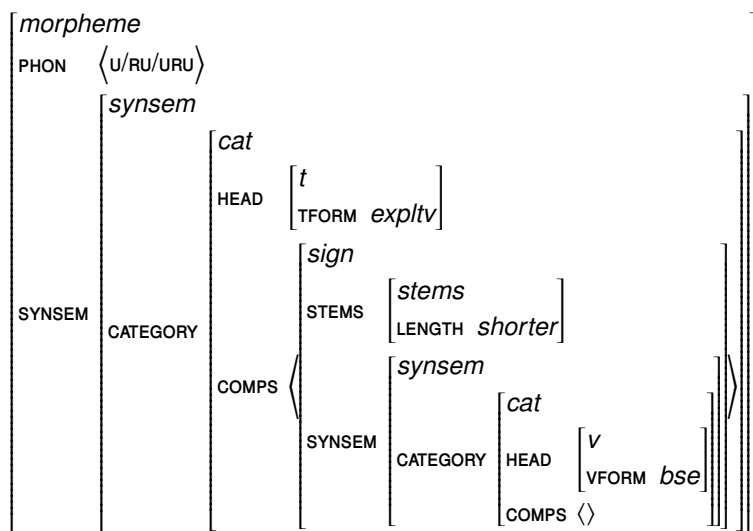


Figure 1: Morpho-syntax of the non-past affix

and the stem allomorph is the shorter in the AwS, as in Figure 1 (Koga 2012).

The lexical specifications of the two-allomorph stem verbs and the one allomorph stem verbs are as follows: The /e/-final allomorphs of the two-allomorph *Xe/X* stem verbs are the basic, and the final /e/-absent allomorphs are the adjusted. The final vowel-absent allomorphs of the two-stem allomorph *k/ko* and *s/se* stem verbs are the basic, and the final vowel-present allomorphs are the adjusted.

The two-allomorph stem verbs have the stem specifications lexically, as exemplified in Figure 2, whereas the one-allomorph stem verbs have no stem specification, as in Figure 3. The non-past affix of the dialect with three allomorphs can pair with the stems of the one-allomorph stem verbs morphologically whereas it can pair only with the shorter allomorphs of the two-allomorph stem verbs, as in Figure 4. You can hear the non-past forms of 266 verbs of the dialect at the url, http://www.chiikigaku.saga-u.ac.jp/sound_db/saga-hogen.html.

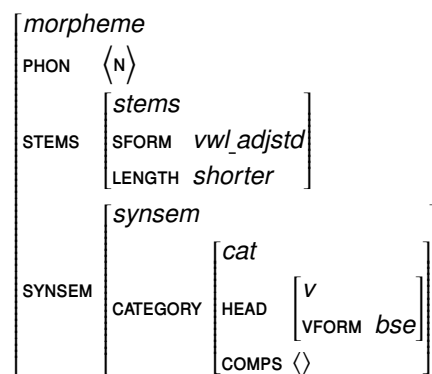


Figure 2: The shorter allomorph of the two-allomorph verb /n(e)/ 'sleep'

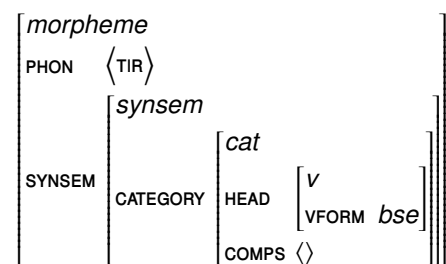


Figure 3: The one-allomorph stem verb /tir/ 'scatter'

Building on Koga (2012; 2015), the current study explains part of the problem of affix allomorph selection, or why some morpho-syntactically well-formed verb forms are morpho-phonologically ill-formed in contrast with others, as one case of Prosodic Morphology (McCarthy and Prince 1993). Every inflectional form resulting from an inflectional rule's relating a stem to an allomorph is a member of the paradigm of the lexeme (Anderson 1992; McCarthy 2005). Greatest common phonemes and consonant-vowel distinction are specified, and the rest are abstracted away. Because of the head

finality in morphology, the final parts of the phonological strings are shared among the verb forms. The paradigm of the verb forms of the lexeme /tab(e)/ ‘eat’ in the dialect, for example, is <ta.be_[adverbial], ta.bu.ru_[non-past], ta.be.ta_[past], ta.beN_[negative]>, and is an instantiation of the paradigmatic pattern <Xe, Xu.ru, Xe.ta, Xe(.ra)N> of the two-allomorph Xe/X stem verbs. The other paradigmatic patterns are:

- (1) a. C-final $X_{[stem]}$: <Xi, Xu, X.ta, XaN>
e.g., <to.ri, to.ru, tor.ta, to.raN>
- b. /i/-final $X_{[stem]}$: <X, X.ru, X.ta, X(.ra)N>
e.g., <o.ki, o.ki.ru, o.ki.ta, o.ki(.ra)N>
- c. $k/ko_{[stem]}$: <Ci, Cu.ru, C.ta, CoN>
- d. $s/se_{[stem]}$: <Ci, Cu.ru, C.ta, CeN>

C, V and X are respectively variables of consonants, vowels and phonological strings in this order.

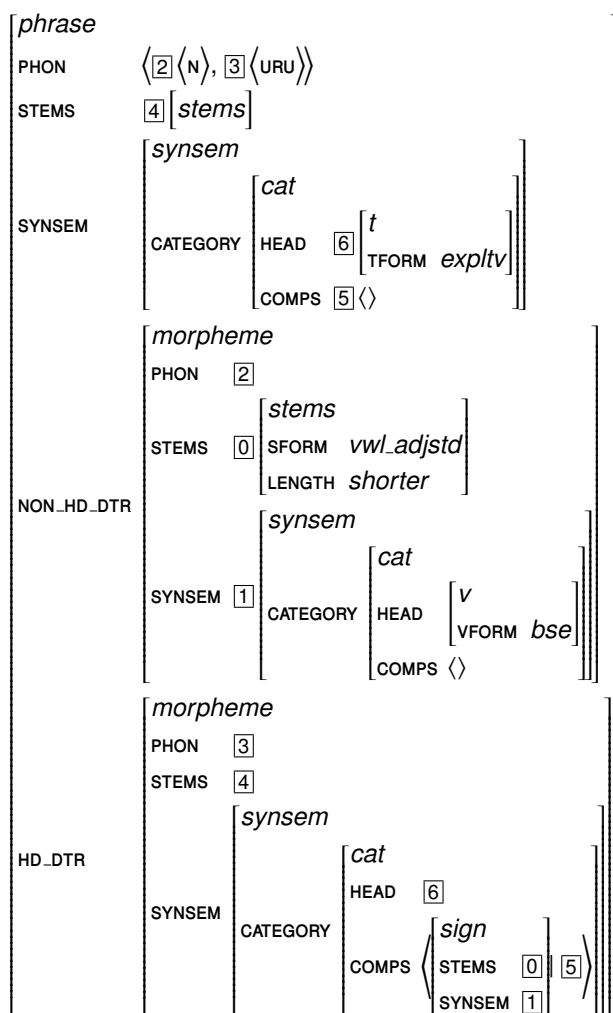


Figure 4: An analysis of /n#uru/ ‘sleep-Non-past’

The paradigms of the phonological strings of the verb forms of the AwS are abstracted into patterns, and the patterns further into schemas, as in Figure 5, similarly to inheritance hierarchy of paradigms of inflectional forms by Corbett & Fraser 1993, Stump 2001, etc. The paradigmatic pattern for the lexemes with C-final stem and that with k/ko or s/se -stem collapse into one abstract schema, as one marked with (C) in the left side of the hierarchy in the figure. All that differ between the paradigmatic pattern of the C-final stem verbs and that of the k/ko or s/se -stem verbs are:

- the former ends with /u/ whereas the latter ends with /uru/ in the non-past forms, and
- the vowel that occurs pre-N for the former is /a/ whereas that for the latter is /o/e/ in the negative forms.

The paradigmatic patterns for the lexemes with stem pattern Xe/X and /i/-final collapse into one abstract schema, as one marked with (V) in the right side of the hierarchy in the figure. All that differ between the paradigmatic pattern of the /i/-final stem verbs and that of the Xe/X stem verbs are:

the right side of the hierarchy in the figure. All that differ between the paradigmatic pattern of the /i/-final stem verbs and that of the Xe/X stem verbs are:

- the vowel that occurs at the end of the adverbial forms, immediately before the /ta/ of the past forms, and immediately before the N of the negative forms is /i/ for the /i/-final stem verbs and /e/ for the Xe/X stem verbs, and
- the vowel that occurs immediately before the /ru/ of the non-past forms is /i/ as well for the /i/-final stem verbs and /u/ for the Xe/X stem verbs.

The prosodic patterns of the forms are predicted by others in the paradigm through the patterns or schemas.

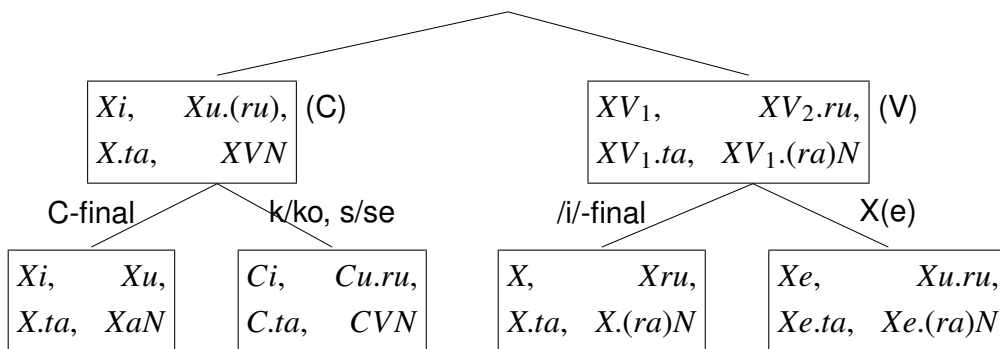


Figure 5: Schemas of paradigmatic patterns of verb forms

I propose that McCarthy's (2005) paradigmatic uniformity extends to paradigmatic patterns of the phonological strings of the verb forms of the lexemes (abbreviated as PPU), as formulated in (2a), and that it is ranked below the

Prosodic Minimality (2b) $PrW_D \leq F_T$ (PM), as given in (2c).

- (2) a. Paradigmatic Pattern Uniformity (PPU): Assign one violation mark to a paradigmatic pattern if it cannot collapse into an abstract schema with another paradigmatic pattern because of the pattern of the forms in one cell.
- b. Prosodic Minimality (PM): $PrW_D \leq F_T$ (Prince and Smolensky 1993)
- c. $PM \gg PPU$
- d. $LexW_D \approx PrW_D$ (Prince and Smolensky 1993)

The minimality of the underlying forms (UFM) follows from PM and the correspondence $LexW_D \approx PrW_D$. All the /ru/-final non-past forms phonetically realize themselves as the second part of the lengthened vowel or the glottal stop or the first half of a geminate consonant. They are both with the same numbers of moras (although the underlying forms are longer one syllable than the corresponding phonetic forms). See Koga (2015; 2020) for how the underlyingly final /ru/ phonetically realizes itself as either.

The paradigmatic pattern uniformity determines which well-formed inflectional form in morphology is well-formed in phonology. **Problem 1: */ku/ 'come-Non-past' and */su/ 'do-Non-past' in contrast with /kuru/ and /suru/:** If the non-past affix were /u/ in place of the allomorph /uru/ for these non-past forms, the paradigmatic pattern would be $\langle Ci, \underline{Cu}, C.ta, CVN \rangle$, or Candidate *b* given in the upper part of Tableau 3. Actually, this would be better in terms of paradigmatic pattern uniformity because the would-be schema is $\langle Xi, \underline{Xu}, X.ta, XVN \rangle$, which is simpler than the real pattern $\langle Xi, Xu.(ru), X.ta, XVN \rangle$. The pattern of the non-past forms *Xu* is simpler than *Xu.(ru)*, or either *Xu* or *Xu.ru*. Yet, the non-past forms */ku/ and */su/, being one mora, violate the UF minimality constraint. Because the constraint related to UFM is ranked above Paradigmatic Pattern Uniformity, this paradigmatic pattern is less optimal. The paradigmatic pattern *a* is therefore optimal.

Tableau 3: UFM \gg PPU

	Non-past Forms = {C, X}+{-u, -uru}	UFM	PPU
Paradigmatic pattern of <i>k/ko</i> and <i>s/se</i> stem verbs			
☞	a. <Ci, Cu.ru, Cta, CVN> b. *<Ci, *Cu, Cta, CVN>	*!	*
Sister: C-final <Xi, Xu, Xta, XaN>			
Paradigmatic pattern of <i>Xe/X</i> stem verbs			
☞	a. <Xe, Xuru, Xe.ta, Xe(ra)N> b. *<Xe, Xu, Xe.ta, Xe(ra)N>		*!
Sister: Vowel /i/-final <X, X.ru, X.ta, X(.ra)N>			
Paradigmatic pattern of the C-final stem verbs			
☞	a. *<Xi, Xu.ru, Xta, XaN> b. <Xi, Xu, Xta, XaN>		*
Sister: <i>k/ko</i> , <i>s/se</i> : <Ci, Cu.ru, Cta, CVN>			

Problem 2: for example, */tabu/ ‘eat-Non-past’, */nu/ ‘sleep-Non-past’ in contrast with /taburu/ and /nuru/: If the affix of the non-past forms were the shorter allomorph /u/ in the non-past forms of the *Xe* and *X* allomorph stem verbs, the paradigmatic pattern would be <Xe, *Xu, Xe.ta, Xe(ra)N>, or Candidate *b* given in the middle of Tableau 3. This would be worse in terms of paradigmatic pattern uniformity because the would-be schema, subsuming this pattern and its sister paradigmatic pattern, is <XV₁, XV₂.(ru), XV₁.ta, XV₁(.ra)N>, which is more complex than the real pattern <XV₁, XV₂.ru, XV₁.ta, XV₁(.ra)N>. The

patterns of the non-past forms are disjunctive, being either /XV₂/ or /XV₂.ru/, which is more complex twice than /XV₂.ru/ in the actual paradigmatic pattern. Therefore, the paradigmatic pattern *a* is optimal. Note that the *Xe/X* stem verbs include ones with the stems *n(e)* and *dz(e)*, and two individual verbs violate the UF minimality, and yet the group of the *Xe/X* stem verbs do not violate the UF minimality. This supports the constraint of the paradigmatic PATTERN uniformity, but not paradigm uniformity.

Summarizing, it is an instantiation of the case in which prosody impinges on morphology in McCarthy and Prince (1993). Such a subcategorization approach as in Paster (2005) that includes the analysis that the shorter allomorph of the non-past affix /u/ never selects the shorter allomorph of the stem of each /X(e)/ stem verb like /tab/ is less superior to our proposal. The fact in the history of Japanese is that the shorter allomorph of the stem of each /X(e)/ stem verb paired with the shorter allomorph of the non-past affix sentence-finally, as in /tab+u/. Note that the uniformity constraint (2a) cannot explain the aforementioned fact (ii), given in the lower part of Table 2, or the non-past forms of one-allomorph stem verbs with the longer affix allomorph, for example, */tir+uru/ ‘scatter-Non-past’ in contrast with /tir+u/. If the longer allomorph /uru/ paired with the one-allomorph and consonant-final stem verb, then the paradigmatic pattern would be <Xi, Xuru, Xta, XaN>, or Candidate *a* given in the lower part of Tableau 3. The schema, subsuming this pattern and the pattern of the *k/ko* and *s/se* stem verbs, would be <Xi, *Xuru, Xta, XaN>, which is simpler, not violating the paradigmatic pattern uniformity. The real one candidate *a* <Xi, Xu(.ru), Xta, XaN> violates the paradigmatic pattern uniformity. Thus, this is an incorrect prediction. McCarthy and Prince’s (1993:117) prosodic delimitation may be relevant. I leave this for future work.

References

- Anderson, Stephen R. (1992). *A-Morphous Morphology*. Cambridge: Cambridge University Press.
- Corbett, Greville and Norman M. Fraser. (1993). Network Morphology: A DATR account of Russian nominal inflection. *Journal of Linguistics* 29(01): 113-142.
- Hall, Erin, Peter Jurgec, and Shigeto Kawahara. (2018). Opaque allomorph selection in Japanese and harmonic serialism: A reply to Kurisu 2012. *Linguistic Inquiry* 49 (3): 599-610.
- Koga, Hiroki (2015). Compensatory geminates in Japanese dialects. *Phonological forum 2015*, Oral presentation, Osaka University, Japan.
- Koga, Hiroki. (2012). Past affix' selection of verbal stems. *Proceedings of the 19th International Conference on Head-Driven Phrase Structure Grammar*, 232-250, CSLI Publications, Stanford University, Stanford, CA, USA.
- Koga, Hiroki (2020). Three-way effects in the complement by two specific-general constraint pairs under the 'subset' principle. *Phonological forum 2020*, Oral presentation (online), Japan.
- Koga, Hiroki and Koji Ono (2010). Surface constraints on multiple occurrences of the tense expletive. In: *Abstracts of International Workshop on Morphology and Formal Grammar*, 36-40, Université Paris IV-Sorbonne, France.
- McCarthy, John. (2005). Optimal paradigms. In Laura Downing, Tracy Alan Hall & Renate Raffelsiefen, editors, *Paradigms in phonological theory*. Oxford University Press, Oxford. ROA-485.
- McCarthy, John J. and Alan Prince. (1993). Prosodic morphology I: Constraint interaction and satisfaction. *Linguistic Department Faculty Publication Series* 14 (2001 version).
- Paster, Mary. (2005). Subcategorization vs. output optimization in syllable-counting allomorphy. In John Alderete et al. (eds.), *Proceedings of the 24th West Coast Conference on Formal Linguistics*, 326-333. Somerville, MA: Cascadilla Proceedings Project.
- Prince, Alan and Paul Smolensky. (1993/2004). *Optimality theory: Constraint interaction in generative grammar*. Malden, MA & Oxford: Blackwell publishing.
- Stump, Gregory T. (2001). *Inflectional Morphology: A theory of paradigm structure*. Cambridge University Press.