

Three-way effects in the complement by two specific-general constraint pairs under the ‘subset’ principle

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ABSTRACT. The current paper proposes an extension of Koga (2015) to the other-way compensation for absence of the word-final liquid, and reveals that the general analyses of the three-way effects are made possible by adopting Anderson’s (1986) ‘subset’ principle or OT’s method of exceptionality by constraints.

Keywords: compensation, geminate consonants, lengthened vowels, OT, ‘subset’ principle, specific and general constraints, stems and affixes of non-past forms of Japanese dialects

1 Phenomenon: for the underlying final /ru/ of the non-past forms

Either the glottal stop (or the first half of a geminate consonant) *or* the second half of the lengthened vowel occurs in place of the final /ru/ if any of every underlying non-past form in the Ariake western Saga dialect of Japanese (AwS hereafter) similarly to those in the majority and minority of the speakers of the Takeo Saga dialect (TS hereafter).¹

1.1 Common

The common is that only the glottal stop occurs if the segment immediately preceding the final /ru/ is within the inflectional affix, as in (1a) (#5 in the figure), (2a) (#8 in the figure), and others (#6, 7 in the figure) in the identical proper subsets of the three Venn diagrams of Figure 1, as the condition articulated by Koga and Ono (2010).

- (1) a. Phonetic Form (PF hereafter): [nuʔ] cf. *[nu:]
b. Underlying Form (UF hereafter): /n +uru/
/sleep +Non-past/
‘(He) goes/will go to bed.’
- (2) a. PF: [suʔ] cf. *[su:]
b. UF: /s +uru/
/do +Non-past/
‘(He) does/will do (it).’

The condition ‘if the segment immediately preceding the final /ru/ is within the inflectional affix’ is equivalent to that if the verb is one with two stems in the pattern of *Xe/X*, *k/ko*, or *s/se* (Koga and Ono 2010). The final /uru/ of these three kinds of verbs is an allomorph of the inflectional affix of the non-past tense in the dialects, as will be argued in section 1.3. Note that both the phonetic form [nu:] if intended to mean ‘sleep-Non-past’ and the phonetic form [su:] if intended to mean ‘do-Non-past’ are ungrammatical. If the former [nu:] is ever grammatical in the AwS, it is a different word with underlying form /nur+u/ ‘paint-Non-past’ or /nuw+u/ ‘sew-Non-past’. If the latter [su:] is ever grammatical in the dialect, it is a different word with underlying form /sur+u/ ‘scratch-Non-past’ (#4 in the figure) or /suw+u/ ‘succumb-Non-past’. The universe of discourse of each Venn diagram is the set of all the underlyingly /ru/-final non-past forms.

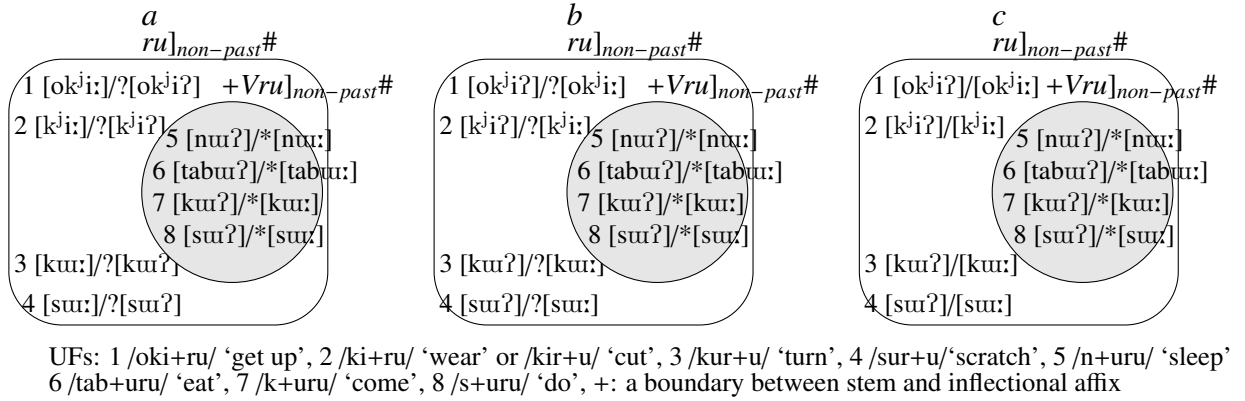


Figure 1: Compensation in subset and complement in AwS (a), majority of speakers of TS (b) and minority of those of TS (c)

1.2 Differences: three-way effects

All that differ among the three is if the segment preceding the final sequence /ru/ is NOT within the inflectional affix, i.e., is within the stem. This condition is the ‘elsewhere’ condition of that of the generalization of the las section. The second half of the lengthened vowel is preferred in the AwS, as in (3), (4) (#1 in the figure), and others (#2, 3, and 4 in the figure) in the complement of the proper subset of the Venn diagram *a* of Figure 1.

- (3) a. PF: [toː] cf. ?[toʔ]
 b. UF: /tor +u/
 /take +Non-past/
 ‘(He) takes/will take (it).’
- (4) a. PF: [okʲiː] cf. ?[okʲiʔ]
 b. UF: /oki+ru/
 /get up +Non-past/
 ‘(He) takes/will take (it).’

The question mark about judgments indicates that the native speakers may understand, for example, [toʔ], but they never use it. The sound data, consisting of each word and a sentence including the word, of 266 non-past forms of the AwS are available at the URL of the data base of Center for Regional Study of Saga, Saga University: http://www.chiikigaku.saga-u.ac.jp/sound_db/saga-hogen.html. As it is confirmed by the sound data, there is no exception of the descriptive generalizations of this section and the section 1.1. The native speakers feel that the lengthened vowels carry sound symbolism of being soft or gentle whereas the glottal stop carries sound symbolism of being hard. The glottal stop, by contrast, is preferred among the majority of the speakers of the TS, as in the complement of the proper subset of the Venn diagram *b*, and whichever it is allowable among the minority, as in that of the Venn diagram *c* of Figure 1 (Koga 2015).

1.3 Motivation for Koga and Ono's (2010) analysis of the non-past forms

There are five paradigmatic patterns depending on stem-final segmental property. The cells of every paradigm are assumed to be the non-past form, the adverbial form, the past form, and the negative form. The paradigmatic pattern of the consonant-final stem verbs is (5); that of the two *Xe/X* stem verbs is (6); that of the vowel-final stem verbs is (7); the paradigm of the two *k/ko* stem verb is (8); that of the two *s/se* stem verb is (9).²

- (5) a. </Xu/[non-past], /Xi/[adverbial], /Xta/[past], /XaN/[negative]>
 b. e.g., </nuru/, /nuri/, /nurta/, /nuraN/> 'paint'
- (6) a. </Xuru/[non-past], /Xe/[adverbial], /Xeta/[past], /Xe(ra)N/[negative]>
 b. e.g., </taburu/, /tabe/, /tabeta/, /tabeN/> 'eat'
- (7) a. </Xru/[non-past], /X/[adverbial], /Xta/[past], /X(ra)N/[negative]>
 b. e.g., </okiru/, /oki/, /okita/, /okiN/okiraN/> 'get up'
- (8) </kuru/[non-past], /ki/[adverbial], /kta/[past], /koN/[negative]> 'come'
- (9) </suru/[non-past], /si/[adverbial], /sta/[past], /seN/[negative]> 'do'

The analysis that the final /uru/ of the non-past forms of the *Xe/X*-stem and *k/ko* and *s/se*-stem verbs, as in (6) (8) and (9), is an allomorph of the non-past affix is supported as follows. Every form of the paradigms of the two stem *Xe/X* verbs, whose paradigmatic pattern is (6), is a complex whose head is morphologically the same as the potential derivational affix, whose paradigmatic pattern is (10).

- (10) a. </u+ru/[non-past], /e/[adverbial], /e+ta/[past], /e+N/[negative]>
 b. e.g., </tabe+ju+ru/, /tabe+e/, /tabe+e+ta/, /tabe+e+N/> 'can eat'

Every non-past form only of the two stem *k/ko* and *s/se* verbs, or the first form of (8) and that of (9), is a complex whose head is the same as that of the potential derivational affix, or the first of (10). All the verb forms of the C-final and V-final stem verbs, as in (5) and (7), have nothing to do with those of the potential derivational affix.³ As the potential affix is derivational whereas the non-past affix is inflectional, the former subcategorizes for a clause whose head is the present participle form, as /tabe+ju+ru/ in (10b), whereas the latter subcategorizes for a clause whose head is the stem, as /tab+uru/ in (6b).

Because the potential derivational affix constitutes the heads of all the forms of the *Xe/X* stem verbs and the heads of the non-past forms of the *k/ko* and *s/se* stem verbs, the verb forms of the *Xe/X* stem verbs are analyzed as (11a) and the non-past forms of the *k/ko* and *s/se* stem verbs as (12a) and (13a).

- (11) a. </X+u+ru/[non-past], /X+e/[adverbial], /X+e+ta/[past], /X+e+(ra)N/[negative]>
 b. </X+uru/[non-past], /Xe/[adverbial], /Xe+ta/[past], /Xe+(ra)N/[negative]>
- (12) a. </k+u+ru/, ... > 'come'
 b. </k+uru/, ... > 'come'
- (13) a. </s+u+ru/, ... > 'do'
 b. </s+uru/, ... > 'do'

Koga (2012) analyzes the final /u+ru/ of 1) /X+u+ru/ of (11a), 2) /k+u+ru/ of (12a) and

3) /s+u+ru/ of (13a) as an allomorph of the non-past affix, as each form separated into the stem and the inflectional affix in (11b), (12b) and (13b) to explain which stem allomorph pairs with which affix allomorph. See Koga (2015) for another motivation with the evidence of the palatal semivowel occurrence like /obo+juru/ ‘remember+Non-past’ similarly to those in the potential forms like /tabe+juru/ in (10b).

2 Proposal

The current paper proposes that the compensation of the AwS will be explained by changing some of Koga’s (2015) rankings of the constraints.

2.1 Koga (2015)

Koga (2015) proposes an analysis of the other two that captures the compensation as a chain of 1) the final vowel absence, 2) the final liquid absence together with the mora remaining, and 3) presence of *either* the glottal stop or the first half of a geminate consonant *or* the lengthened vowel, as schematized in ... $Vru\#$ - ... $Vr_{\mu}\#$ - ... $VH_{\mu}\#$ - $V\?/V:\#$, in Harmonic Serialism of Optimality Theory, as developed in McCarthy (2016). The symbol μ is a mora associated with no segment, and the symbol H is the placeless counterpart of the liquid in this case. See Koga (2015) for absence of the final vowel. The proposal for the majority of the speakers of the TS are (14).

- (14) a. $MAX[Manner:M] \gg HAVEPLACE$
 b. $\{CONTIG, *...[\sigma (C)V]_{[Tns\ expl]\#}\} \gg CODACOND \gg \{HAVEPLACE, MAX[Place]\} \gg NoLINK[Place] \gg MAX[Manner]$
 c. $IDENT_{affix}[Long] \gg IDENT[Cons] \gg NoLINK[Place]$

The rankings for the minority of the speakers of the TS is the same as (14) except for (15) replacing (14c).

- (15) $IDENT_{affix}[Long] \gg \{IDENT[Cons], NoLINK[Place]\}$

See Koga (2015) for the argumentations for the rankings. The constraints and rankings in (14a) and (14b) are shared by the three groups, and relevant to predict the associations in the series of ... $Vru\#$ - ... $Vr_{\mu}\#$ - ... $VH_{\mu}\#$. The constraints and rankings relevant to the rest of the associations, or the series of ... $VH_{\mu}\#$ - *either* $V\?$ *or* $V:\#$ are those of (14c) and (15).

2.2 Two pairs of constraints standing as specific and general in Pāṇinian relation

Among $IDENT_{affix}[Long]$, $NoLINK[Place]$, and $IDENT[Cons]$, there are two pairs of constraints standing as specific and general in Prince and Smolensky’s (1993:131) Pāṇinian relation. They are the pair of $IDENT_{affix}[Long]$ and $NoLINK[Place]$ and the pair of $IDENT_{affix}[Long]$ and $IDENT[Cons]$. The specific constraint $IDENT_{affix}[Long]$ (S), which is morphological and requires that the length of any vowel in the affix identical between the output and input forms, remains at the same ranking in Koga (2015), i.e., outranks two general constraints. The constraint $NoLINK[Place]$ (G-s), which prevents the Place values from

delinking and linking, is a general constraint with the opposite effect of that of the specific constraint. The constraint IDENT[Cons] (Gs), which requires the consonantal values of the input and output identical, is another general constraint with the same effect as that of the specific constraint. As known as a specific constraint's blocking of a general constraint, the general constraints G-s NoLINK[Place] and Gs IDENT[Cons] have no actual effect on the members of the proper subset that the specific constraint S IDENT_{affix}[Long] has an actual effect on. See Prince and Smolensky (1993:129-138) for a theorem to determine ranking between a specific constraint and a general constraint in a Pāṇinian relation by visibility of the effects of the constraints.

2.3 Proposal for three-way effects

Which effect occurs in the complement is determined by which general constraint is ranked higher than the other under the domination by the specific constraint. If G-s outranks Gs, the lengthened vowel is present in the complement. This is the prediction for the AwS, as given in Venn diagram *a* of Figure 1, as computed in the left of Tableau 1.

Tableau 1: Harmonic improvements of Intermediate Form (IF hereafter) *nuH* for UF /n+uru/ 'sleep-Non-past' and UF /nur+u/ 'paint-Non-past'

AwS					Major-Takeo					Minor-Takeo				
		S IDENT _{affix} [Long]	G-s NoLINK[Place]	Gs IDENT[Cons]			S IDENT _{affix} [Long]	Gs IDENT[Cons]	G-s NoLINK[Place]			S IDENT _{affix} [Long]	G-s NoLINK[Place]	Gs IDENT[Cons]
Last Step: <i>nuH</i> (UF: /n+uru/) 'sleep-Non-past'														
☞	a. [1] nu?		*		☞	a. [1]			*	☞	a. [1]			*
	b. [2] nu:	*		*		b. [2]	*	*			b. [2]	*		*
Last Step: <i>nuH</i> (UF: /nur+u/) 'paint-Non-past'														
☞	a. [3] nu:			*		a. [3]		*		☞	a. [3]			*
	b. [4] nu?		*		☞	b. [4]			*	☞	b. [4]		*	

What follows is how the rankings for the AwS (16) make correct predictions, as computed in the left of Tableau 1. First, for the constraint S IDENT_{affix}[Long], the association between IF *nuH*, the UF of which is /n+uru/, toward UF and the candidate IF *nu:* toward PF violates the constraint because the vowel /u/ of the affix is lengthened, as a violation mark occurring in *b* of the upper computations in the tableau. The association between *nuH*, the UF of which is /nur+u/, and the candidate *nu:*, by contrast, does not violate the constraint because the lengthened vowel is one of the stem, as no violation mark occurring in *a* of the lower computations in the tableau. The association between *nuH*, whichever it is either for UF /n+uru/ or for UF /nur+u/, and the candidate *nu?*, by contrast, does not violate the constraint IDENT_{affix}[Long] because the vowels are not lengthened, as no violation mark occurring in *a* of the upper computations and in *b* of the lower computations. Next, for the two general constraints G-s and Gs, either of which has no morphologi-

cal condition, the predictions for the occurrences of nuH of /n+uru/ and /nur+u/ are the same. For the constraint G-s NoLINK[Place], the association between nuH and the candidate $nu:$ does not violate the constraint because the placeless counterpart of the liquid H is not linked with another place, as no violation mark occurring in b of the upper computations and a of the lower computations. Vowels have no Place feature. By contrast, the association between nuH and the candidate $nu?$ violates the constraint because the place features are delinked and linked. The glottal stop is of another place feature distinct from the placeless. For the constraint Gs IDENT[Cons], the violation markings are reverse of the computations for the constraint NoLINK[Place]. Each association between nuH and the candidate $nu:$ violates the constraint because the consonantal feature of the placeless counterpart of the liquid is plus, and that of the second part of the lengthened vowel is minus, as violation marks occurring in b of the upper computations and a of the lower computations. By contrast, the association between nuH and $nu?$ does not violate the constraint because the placeless counterpart of the liquid and the glottal stop are both consonantal. Therefore, by the rankings of $S\ IDENT_{affix}[Long] \gg G\text{-}s\ NoLINK[Place] \gg Gs\ IDENT[Cons]$, which was proposed for the AwS, the candidate $nu?$ is optimal for /n+uru/, and the candidate $nu:$ is optimal for /nur+u/. This is the correct prediction.

The rankings of the constraints as a whole, which explain the associations in the series of ... $Vru\#$ - ... $Vr_{\mu}\#$ - ... $VH_{\mu}\#$ - either $V?$ or $V:\#$ for the AwS, are (14a), (14b) and (16), as all represented in the Hasse Diagram in Figure 2.

$$(16) \text{IDENT}_{affix}[Long] \gg \text{NoLINK}[Place] \gg \text{IDENT}[Cons]$$

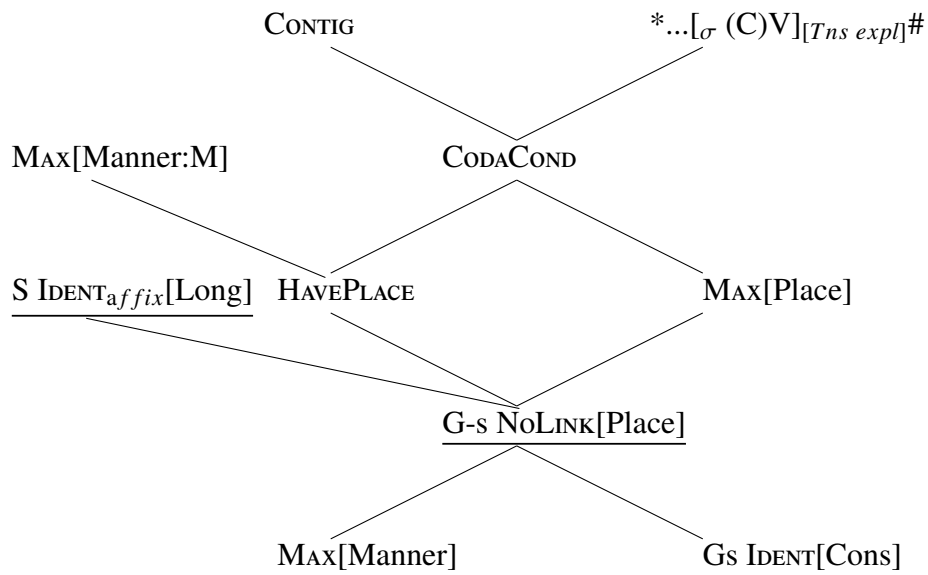


Figure 2: Hasse Diagram for AwS

The ranking of the constraint S NoLINK[Place] is determined by other constraints as in (16a) and (16b) the same in the three groups.

If Gs outranks G-s, which is included in the rankings (14), the glottal stop is present in the complement of the proper subset. This is the prediction for the majority of the speakers of the TS, as given in Venn diagram *b* of Figure 1, as computed in the center of Tableau 1. If Gs and G-s are ranked the same, either the glottal stop or the lengthened vowel is present in the complement. This is the prediction for the minority of the speakers of the TS, as given in Venn diagram *c* of Figure 1, as computed in the right of Tableau 1.

3 Theoretical implication

The current proposal as well as Koga's (2015) OT analysis are made possible by adoption of Anderson's (1986) analysis of Georgian plural marker /-t/ under the 'subset' principle or the foundational concept of OT, exceptionality by constraints (e.g., in McCarthy and Prince 1993). Anderson (1986) proposes a rule for the plural marker /-t/ by including no 'except when' condition (of various kinds of subsets in number, person and gender) in the context and creating the exceptions as distinct rules applying prior to the general rule; therefore, the rule of the plural marker is general. Without the rule ordering, Anderson would have to state the plural marker /-t/ occurs except for ..., except for ..., ... with the number of the 'except when' clauses six to seven. Anderson's (1986) insight is shared by Optimality Theory as its foundational concept. Grammar derives pattern of exceptionality by [having an exception as another constraint] and ranking constraints (McCarthy and Prince 1993: 36; 68, bracket is mine). Without the constraint ranking, constraints would be narrowed down including 'except when' conditions not to be universal.

If the $r \rightarrow ?$ rule (for S IDENT_{affix}[Long]) applies prior to the rules of $r \rightarrow (V)$: (for G-s NoLINK[Place]) and $r \rightarrow ?$ (for Gs IDENT[Cons]), then the general rules do not have to be restricted like 'except when the preceding segment to the final /ru/ is within the affix.' In the same vein, if the specific constraint S IDENT_{affix}[Long] is ranked higher than the general constraints G-s NoLINK[Place] and Gs IDENT[Cons], then the general constraints do not have to be artificially narrowed like 'except when the segment preceding the final /r(u)/ is within the affix'. What OT analysis allows as constraints are only universal ones; they are all relevant to the particular grammars of all the languages however they are ranked in each. Therefore, exceptionality must be explained by constraint rankings or rule orderings. That is, constraint rankings or rule orderings are essential in grammar because constraints prevalently stand as specific and general in Pāṇinian relation in languages.

Notes

¹ Hayata (1998) observed that if a non-past form final /ru/ was utterance-final or was followed by a vowel of another word or affix, it phonetically realizes itself as the glottal stop.

² The underlying past forms with the stem being consonant-final and with the initial affixal segment being /t/ have various phonological interactions for the consonant clusters. For example, /nur+ta/ 'paint' phonetically

realizes itself in the serial associations of *nur_μta* - *nuH_μta* - [ntutta].

³ The allomorph of the non-past affix for the C-final stem verbs may be the stem of the potential derivational affix. The allomorphs of the non-past affix are analyzed as /u/, /ru/ and /uru/ in Koga and Ono (2010).

Acknowledgments

I thank the audience of Phonological Forum 2020 for comments on my oral presentation which the current paper is a developed version of. I feel thankful for Koji Ono's informal discussions with me. Yet all the shortcomings are mine.

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