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PROSODICALLY-DRIVEN CONSTRAINT RE-RANKING IN OPTIMALITY THEORY

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Abstract

Constraint re-ranking is no novelty under the rubric of Optimality Theory. Sources in the OT literature such as Ito and Mester (1992) and Kubozono (2002) help us understand the theoretical role played by such re-rankings and their implications. While a world without constraint re-ranking is indubitably the desideratum for OT theorists, a more modest aim will be to constrain such re-rankings and rid them of any arbitrariness so that the theory is not undermined. It is in this sense that our attempt is novel.

In this paper our endeavour is to tie up constraint re-ranking with a prosodic category, namely the syllable. More particularly, we attempt to show that the constraint re-ranking underlying phonological processes discussed in Kubozono (2003) can be minimized and the same can be determined by the weight of the first syllable or the head syllable and is not idiosyncratic to lexical items as shown in the paper.

The paper is organized as follows: Section One provides a summary of the relevant literature, namely Ito and Mester (1992), Kubozono (2002) and the Iambic-Trochaic Law whose robustness can be questioned. Section Two outlines our analysis in the context of cited literature. Sections Three through Seven present our analyses of the processes in Japanese. Section Eight provides some concluding remarks.

1. Overview

a. The Phonological Lexicon, Ito and Mester (1992)

Itô and Mester (1992) introduce the notion of division of the lexicon into different strata: namely, native (or Yamato), Sino-Japanese, and Western loans at various stages of assimilation. It presents a model of the phonological lexicon, which aims to account for the phonological differences between the various strata within a unitary system. In this model, the central notion is that of a "lexical constraint domain"; analyzing lexical stratification therefore entails analyzing the inclusion and overlap relations between constraint domains. The welcome consequence is that one sees the organization of lexical items in terms of an overall core-periphery structure (the closer a "word" is towards the native stratum in the hierarchy, the greater core behaviour it displays viz., the more markedness constraint it obeys and the farther it is from the native stratum, the lesser markedness constraints, it obeys).

In order to provide a principled explanation for the possible variations across strata, it is argued that only the ranking of input-output faithfulness constraints is involved in differentiating between strata. The strata-indexed faithfulness model couched within Optimality Theory is shown to be better compared to an input specification approach because it not only accounts for the core-periphery distribution of lexical items, but at the same time also captures higher-level hierarchical implicational relations without additional mechanisms.

b. The Syllable as a Unit of Prosodic Organisation, Haruo Kubozono (2003)

Kubozono (2003) looks at the possible types of trochaic feet various morpho-phonological processes yield in Japanese from an OT-theoretic perspective. Crucially, the feet output by these processes are restricted by syllable weight challenging the classification (Trubetskoy, 1969) that Japanese is a "syllabic trochee."

Kubozono (2003) shows that under a disyllabic minimum only three out of the four possible foot-forms are allowed, namely #(H)L#, #(H)(H)# and #(LL)# in a majority of the processes. The occurrence of #(LH)#, the canonical Iamb, is obviously negligible in a trochaic language like Japanese (Labrune, 2002). If the mere presence of an #(H)L# foot impugns the empirical basis of the Iambic-Trochaic Law (according to which trochaic languages are not duration-sensitive), then the preference Kubozono (2003) reports for such a foot over #(H)(H)# and even the canonical trochee #(LL)#, which seems to be the least preferred of the possible outputs, is a categorical argument against the said law.

Aside from questioning the absoluteness of the Iambic-Trochaic Law, Kubozono (2003) posits re-ranking of crucial constraints to account for the three types of feet. Although re-ranking is definitely required to account for why different outputs arrive with different types of feet, the mode of such re-ranking is highly suspect.

Kubozono (2003) follows Ito and Mester (1995a) in assuming that "free" constraint-re-ranking is a peculiar property of Japanese phonology. In other words, the analysis in Kubozono (2003) takes constraint-ranking as being idiosyncratic to individual lexical items. Although such re-ranking of crucial constraints does account for the facts without glitches sufficiently, it does so at the cost of undermining the theory greatly.

c. The Iambic and Trochaic Law

The fact that foot structure affects syllable weight is well known from the analysis of minimal word effects. Lengthening or shortening processes that are sensitive to foot structure (henceforth, quantitative adjustments) are also quite common. For example, in Yupik, LL sequences lengthen when footed iambically to become (L H) and this process is known as Iambic Lengthening (Hayes 1985, 1995 and McCarthy & Prince 1986). This standard theory takes the asymmetric (L H) iamb to be the perfect iamb, and iambic lengthening is taken to be a rule that strives for this ideal.

According to Hayes (1985, 1995), there is a durational asymmetry between iambic and trochaic feet. While trochaic feet (* .), exhibit no durational contrasts (the head and the tail both have even duration), iambic feet (. *) are inherently asymmetrical (because the head appears to be durationally enhanced compared to the tail). Hayes claims that the asymmetry in the foot inventory is grounded in an extra-linguistic principle of rhythmic grouping known as the Iambic/Trochaic Law (Hayes 1995:80):

(1) <u>The Iambic/Trochaic Law (I-T Law):</u>

a. Elements contrasting in intensity naturally form groupings with initial prominence.

b. Elements contrasting in duration naturally form groupings with final prominence.

To account more uniformly for all of the quantitative adjustments a slightly modified version of the theory of foot typology is proposed by Prince 1990, within Optimality Theory (OT; Prince & Smolensky 1993). In Prince's theory, disyllabic feet are evaluated based on a function known as Grouping Harmony.

Grouping Harmony assigns a numerical value to a disyllabic foot. It is calculated by dividing the size (in moras) of the second syllable of the foot by the size of the first syllable. If the size of the second syllable is greater than the first, the numerical value is greater, and therefore the Harmony of the foot is better.

According to this theory as well, it was spelt out that the uneven L H was a canonical iamb and an ill-formed trochee leaving L L as the canonical trochee and an ill-formed iambic foot therefore reinstating the premise on which the edifice of the I-T Law has been erected. However, this seemingly principled account in defence of the I-T-Law appears shaky on the face of the data we get to study in Kubozono (2003).

2. Prosodically-driven Constraint Re-ranking:

The ranking of different lexical strata vis-à-vis indexed faithfulness constraints (Ito and Mester, 1992) as well as "free" ranking of crucial constraints (Kubozono, 2003) represent re-ranking of constraints at some level. However, in both these cases, more so in the case of Kubozono (2003), the phonological reasoning behind such re-ranking seems to be a bit up in the air.

Our basis for constraint re-ranking not only enables us to account for the same set of data found in Kubozono (2003) but it also enables us to do so in a more elegant fashion. The rationale is simple: given a disyllabic minimum (and maximum, in most cases), determining the weight of the initial syllable seems to constrain the weight of the second syllable or non-head. The constraint re-rankings vary accordingly thus making re-ranking a prosodic business.

With the addition of a simple constraint, militating against the presence of an #LH# foot in a trochaic language, we will be able to further reduce the number of constraints involved in the re-ranking from three to two and illustrate why the generally preferred trochee #LL# is the least preferred in Japanese.

Apart from a couple of general faithfulness constraints of the schema IDENT-IO and MAX operating at the level of vocalic and consonantal segments (which will be invoked to cover a couple of optional processes) and certain additional constraints required for Emphatic Mimetics the following is the pool of constraints to be employed in this paper:

a) NONFINALITY (σ'): No Head Syllable is final in PrWd.
b) NONFINALITY (FT''): No Head Foot is final in PrWd.
c) *LH: Disallow feet of the form #(LH)# in a trochaic language.
d) PARSE-σ: Every syllable is parsed into feet.
e) ALIGN-L (FT', PRWD): The left edge of every foot of a PrWd is aligned with the left edge of the PrWd.
f) MAX- SEG: Every segment in the input has a correspondent in the output.
g) DEP-μ: No epenthesis of a mora.
h) FOOT BINARITY (FT'BIN): Feet are binary under moraic or syllabic analysis.

Ranking *LH on top will enable us to rank NonFinality as a single constraint right below it unlike in Kubozono (2003) where NONFINALITY (σ') is ranked below PARSE-σ and Align-L only for #LL# truncations, being ranked high elsewhere. Consequently, even when NONFINALITY (σ') is violated in an #(LL)# output, it will do so only in order to avoid violating undominated *LH.

A preliminary ranking of the above constraints will be as follows:

#(H)(H)#: FT'BIN, *LH >> NONFINALITY>> PARSE-σ >> Align-L>> DEP-μ>>MAX-SEG

#(H)L#: FT'BIN, *LH >> NONFINALITY>> Align-L >> PARSE-σ >> DEP-μ>>MAX-SEG

#(LL)#: FT'BIN, *LH >> NONFINALITY>> Align-L, PARSE-σ >> DEP-μ>>MAX-SEG

It is to be noted that the constraint FTBIN will not be employed in the analysis as it is undominated and inviolable and therefore not "crucial" in OT terms for our ranking purposes.

3. Loanword Truncation

For the analysis of loanwords we will restrict our analysis to those referred to as Simple Abbreviated Loans (SALs) (Labrune, 2002) with apocope at the right edge, found in Kubozono, 2003. The following is a short list of loanwords fulfilling our criteria in Japanese:

(1)

a. su.to. <rai.ki>, *su.<to.rai.ki>	'strike'
tyo.ko.<ree.to>, *tyo.<ko.ree.to>	'chocolate'
b. roo.te<e.syon>, *roo.<tee.syon>	'rotation'
dai.ya. <mon.do>, *dai. <ya.mon.do>	'diamond'
c. baa.ten. <daa>, *baa.<ten.daa>	'bartender'
d. ro.ke<e.syon>, *ro.kee. <syon>	'location'
de.mo<n.su.to.ree.syon>, *de.mon.<su.to.ree.syon>	'demonstration'

Outputs that emerge from this process are minimally bimoraic and (for our purposes) maximally disyllabic (viz., a mora count with upper limit of four). Of the morpho-phonological processes discussed in Kubozono (2003), Loanword Truncation is the only one, which allows bimoraic outputs and therefore #(LL)# feet. Consequently, NONFINALITY (σ'), which is higher ranked for #(H)(H)# and #(H)L# patterns is ranked below both Parse σ and Align-L, which are not ranked with respect to each other, to allow for #(LL)#.

Under our analysis though, undominated *LH enables us to rank NONFINALITY as a monolith on top. With constraint re-ranking now reduced to Parse-σ and Align-L, the three foot-patterns are a result of three possible rankings between the two constraints: when Align-L dominates Parse-σ, we have an #(H)L# while the reverse ranking fetches #(H)(H)#. Lack of ranking between the two constraints underlies the #(LL)# trochee.

(1) LH → LL

/ro.kee.syon/	*LH	NonFin	Align-L	Parse - σ	MAX-SEG
a. (ro)		Syll, FT'*!			tee.syon
b. ☞ (ro.ke)		FT' *			syon
c. ro (kee)	*!	FT' *!	*	*	syon
d. (ro.ke)(syon)		FT'*!	**!		

Tableau 1

The canonical uneven Iamb, candidate (c), is ruled out of a trochaic language irrespective of its violation of all constraints. Candidate (a) violates both

NonFinality (FT') and NonFinSyll and is therefore ruled out. Though both candidates (b) and (d) tie over one violation of NonFinality (FT') (now uniformly ranked on top) the latter incurs extra violations of Align-L and candidate (b) emerges optimal.

(2) LH→ HL

/roo.tee.syon/	*LH	NonFin	Align-L	Parse -σ	MAX-SEG
a. (roo)		FT', Syll*!			tee.syon
b. (roo) (tee)			*!		syon
c. ☞ (roo)te				*	e.syon
d. (roo)(tee)(syon)			*!*		

Tableau 2

In the above tableau, candidate (a) is clearly suboptimal as it is the only candidate that violates NonFinality. The #(H)(H)# output in (b) and the #(H)(H)(H)# in (d) both incur one and two violations of Align-L respectively to satisfy lower-ranked ParseSyll. Candidate (c) does the reverse and emerges optimal.

(3) HH→ HH

/baa.ten.daa/	*LH	NonFin	Parse-σ	Align-L	MAX-SEG
a. (baa)		Syll, FT'*!			ten.daa
b.				**!	

(baa)(ten)(daa)					
c. (baa)te			*		n.daa
d. ☞ (baa)(ten)				*	daa

Tableau 3

The above tableau does not have an LH output either. The worst candidate is (a) as it violates NonFinality, virtually undominated, as *LH applies only vacuously. Candidate (c) violates higher-ranked Parse-σ in order to satisfy Align-L and is ruled out by the principle of strict domination among constraints. Candidate (d) emerges optimal past candidate (b), as the latter incurs an additional, superfluous violation of Align-L.

2. Zuzya-go Formation (ZG):

This process outputs lexical items, which are minimally disyllabic but trimoraic therefore ruling out the presence of #(LL)# forms. It is also no surprise at all that the only four-moraic form that is banned is #LHL# which would call for L and H to be fatally footed together.

The process involves metathesis of two moras from the left edge of the word with two from the right edge (exhaustively). The following list of words shows a marked preference for #(H)L# structures also indicating that when the input itself is #HL# the metathesis is not exhaustive and that only the first and last moras are switched leaving the second mora untouched.

(2)

(a) L→ HL hi 'fire, cigarette light' → ii.hi, me 'eye' → ee.me

(b) H→ HL kii 'key'→ ii.ki, ai 'love' → ii.a, paN 'bread→ N:.pa

(c) LL→HL zya.zu 'jazz'→ zuu.zya, me.si 'rice'→ sii.me

(d) HL→HL dan.su 'dance'→ sun.da, doi.tu 'Germany' →tui.do

(e) LH→HL hu.men 'score'→men.hu, ta.buu 'taboo'→buu.ta

(f) HH→HH koo.hii (or koo.hi) 'coffee'→hii.koo, ron.don→don.ron

(1) LL→ HL

/zya.zu/	*LH	NonFin	Align-L	Parse-σ	Dep-μ
a. (zu.zya)		FT' *!			
b.☞ (zuu).zya				*	*
c. zu(zyaa)	*!	FT', Syll *!	*!	*	*
d. (zuu) (zyaa)			*!		**

Tableau 4

Candidate (c) does not constitute a well-formed trochaic foot. It encounters violations against all constraints to add to the fundamental disqualification as well. Candidate (a) violates NonFin (FT') and (d) fatally violates Align-L ranked above Parse-σ. Candidate (b) satisfies higher-ranked Align-L and comes out as the best possible candidate. The optimal output is an #(H)L# type.

(2) HH→ HH

/ron.don/	*LH	NonFin	Parse- σ	Align-L	Dep-μ
a. ☞ (don)				*	

(ron)					
b. (don) ro			*!		
c. ro(don)	*!	FT', Syll*!	*!	*	
d. (do.ro)		FT'*!			

Tableau 5

Candidate (a), (b) and (d) all incur just one violation and in that respect at least are tied even as the LH output in (c) is ruled out by all criteria. Candidate (d) fatally violates "almost" undominated NonFin (FT') and goes out of the race. Candidate (b) violates ParseSyll and (a) violates Align-L but the ranking of the two constraints rules the verdict in favour of the #(H)(H)# candidate in (a).

(3) Optionality between HH and HL outputs:

A. /koo.hii/	*LH	NonFin	IDENT Vowel Length	Align-L
a. (hi.ko)		FT'*!	*!*	
b. (hii)ko			*!	
c. hi(koo)	*!	FT', Syll *!	*!	*
d. ☞ (hii) (koo)				*
B. /koo.hii/	*LH	NonFin	Align-L	IDENT Vowel Length
a. (hi.ko)		FT'*!		**!
b. ☞ (hii)ko				*
c. hi(koo)	*!	FT', Syll *!	*!	*
d. (hii) (koo)			*!	

Tableau 6

In both 3 (A) and (B) candidates (a) and (c) are ruled out as the former violates NonFin (FT') and the latter violates both clauses of NonFinality and incurs an additional violation of Align-L apart from violating undominated *LH. It is here that the ranking of IDENT-IO (Vowel Length) (a constraint not employed in Kubozono (2003)) comes to the fore. When it is ranked on top of Align-L, the #(H)L# output – (d) as in (A) – emerges optimal and when the ranking is reverse candidate (b) – as in (B) – comes out "best".

One may raise an objection to the absence of Parse- σ. But the faithfulness constraint militating against the change in vowel length between input and output does more than the work performed by Parse- σ in a way accommodating the work of the latter too. For example, in candidate (b) if there is an additional mora in the second syllable, it will be a foot and will trivially "look like" candidate (d). The question therefore is not essentially of syllables being parsed into feet or not, but of how changes in vowel length affect the output prosodically. Remarks made here are attested for in the optionality to be found in sporadic shortening (see Section 6) as well.

3. Motherese (Mother-Baby Language)

Another evidence for the dominance of #HL# over other feet comes from motherese. The outputs generated by this type of "language" (process) are typically disyllabic with #HL# and #HH# being the most common word types – in that order – as is the case with other processes as well. There are to be found, less frequently however, trimoraic #LLL# patterns, formed by the reduplication of a monomoraic base and prefixing of the honorary marker *–o*.

(3) Adult Form	Baby Form	Examples
a. L	HL	ha → pap.pa
b. L	LLL	te → o.te.te, me →o.me.me
c. H	HH	hau → hai.hai
d. LL	HL	ma.ma→mam.ma,daku→ dak.ko
e. LH	HL	o.buu → om.bu

(1) LL→ HL

Input: /ma.ma/	*LH	NonFin	Align-L	Parse-σ	Dep-μ
a. (ma.ma)		FT' *!			
b. ☞ (mam)ma				*	*
c. ma (maa)	*!	Syll, FT'*!	*!	*	*
d. (maa) (maa)			*!		**!

Tableau 7

Candidate (c) the canonical Iamb is ruled out categorically. Candidate (a) fatally violates the "foot" clause of NonFinality and is therefore ruled out. Candidate (d) incurs an additional violation of Dep-μ vis-à-vis candidate (b) apart from violating Align-L to satisfy lower-ranked Parse-σ. Consequently, candidate (b) emerges optimal.

(2) LH→HL

Input: /o.buu/	*LH	NonFin	Align-L	Parse- σ	Dep-μ
a. (o.bu)		FT', Syll *!			
b. o(buu)	*!	FT', Syll*!	*!	*	*
c. ☞ (om)bu				*	*
d. (om)(buu)			*!		**!

Tableau 8

Candidate (b) is an LH output and is ruled out. It also shares with candidate (a) violations of both clauses of NonFinality and therefore candidate (a) is also out of the reckoning. The #(H)L# in (c) emerges optimal as candidate (d) violates Align-L and Dep-μ twice.

(3)H→HH

Input: /hau/	*LH	NonFin	ParseSyll	Align-L	Dep-μ
(a) (hau)		FT', Syll *!			
(b) ☞ (hai) (hai)				*	**
(c) (hai) ha			*!		*
(d) ha (hai)	*!	FT', Syll*!	*!	*	**

Tableau 9

Candidate (a) and (d) are tied over fatal violations of NonFinality and the latter also violates undominated *LH and both are ruled out. Candidate (c), had Align-L been ranked above Parse- σ, would have come out optimal. But under the established ranking candidate (b) emerges optimal.

4. Sporadic Processes (Lengthening and Shortening)

The HL-LH asymmetry that has been observed so ubiquitously across our discussion thus far is found to be rampant in diachronic changes as well, especially those involving Sino-Japanese (SJ) compounds. These phonetic and historical changes fall into three groups as displayed in the data below:

Lengthening:

(4) LH→ HH (informally called trochaic lengthening in Kubozono, 2003):

a. zyo.oo→ zyoo.oo 'woman king/queen

cf. oo.zyo→ *oo.zyoo 'king's daughter/princess'

b. nyo.boo→ nyoo.boo 'wife (woman+chamber)'

cf. nan.nyo→ *nan.nyoo 'man and woman'

(5) LL→HL

a. si.ka→sii.ka 'poem', hu.hu→huu.hu 'a married couple', hu.ki→huu.ki 'riches and honours'

b. mit.tu→ 'three', mu.tu→mut.tu 'six', sa.ki→sak.i 'a little while ago', ta.da→tat.ta 'only'

Shortening (optional):

(6) a. tyoo.tyoo→ tyoo.tyo(o) 'butterfly', nyoo.boo→nyoo.bo(o) 'wife' (colloquial)

b. hon.too→ hon.to 'true', sen.see→sen.se 'teacher'

c. gak.koo→ gak.ko(o) 'school', kak.koo->kak.ko(o) 'appearance'

Lengthening of #LH# to #HH#: Parse- σ >> Align-L

Input: /nyo.boo/	*LH	NonFin	Parse- σ	Align-L	Dep- μ
a. (nyo.bo)		FT' *!			
b. nyo(boo)	*!	FT', Syll*!	*!	*	
c. (nyoo) bo			*!		*
d.☞ (nyoo)(boo)				*	*

Tableau 10

Candidate (b) with the #LH# structure is categorically ruled out on several grounds including its violation of the top two constraints. Candidate (a) incurs a fatal violation of NonFinality in terms of feet and is therefore rejected. Though both candidates (c) and (d) incur one violation of Dep- μ, the former violates higher ranked Parse- σ therefore enabling (d) to emerge optimal.

Lengthening of #LL# to #HL#: Align-L >> Parse- σ

Input: /hu.ki/	*LH	NonFin	Align-L	Parse- σ	Dep- μ
a. (hu.ki)		FT' *!			
b. hu(kii)	*!	FT', Syll*!	*!	*	*
c.☞ (huu)ki				*	*
d. (huu)(kii)			*!		*!*

Tableau 11

The faithful candidate (a) incurs a fatal violation of NonFin (FT'). The #LH# candidate in (b) accumulates all possible violations of the constraints in the inventory and is perhaps the worst candidate. Candidate (d) loses out to candidate (c) on account of the latter violating higher-ranked Align-L to satisfy lower-ranked Parse- σ as well as its additional violation of Dep- μ.

Optionality between #HH# and #HL# (with/without a long final vowel)

A. tyoo.tyoo	*LH	NonFin	IDENT Vowel Length	Align-L
a. (tyo.tyo)		FT'*!	*!*	
b. tyo (tyoo)			*!	
c. tyo(tyoo)	*!	FT', Syll *!	*!	*
d.☞ (tyoo)(tyoo)				*
A. tyoo.tyoo	*LH	NonFin	Align-L	IDENT Vowel Length
a. (tyo.tyo)		FT'*!		**!
b. (tyoo)(tyoo)			*!	
c. tyo(tyoo)	*!	FT', Syll *!	*!	*
d. ☞ (tyoo)tyo				*

Tableau 12

(See Section 4 for elaboration on the IDENT constraint and why Parse- σ is redundant in this context). Candidates (a) and (c) are both ruled out in each case. The latter is the least preferred #LH# form, which stacks violation of all constraints and the former violates the "foot" clause of NonFinality. The choice between candidates (b) and (d), then boils down to the ranking between IDENT-IO (Vowel Length) and Align-L. The former emerges optimal when Align-L is ranked above IDENT-Vowel Length; when the ranking is reversed, candidate (d) emerges optimal.

5. Emphatic Mimetics

"A typical mimetic form in Japanese involves reduplication of a bimoraic mimetic base." (Kubozono, 2003). The bimoraic bases themselves cannot be used in isolation; they can either be used in the four-mora reduplicative form (as shown in the data below) or in a "four-mora form with a mimetic ending /-ri/ and a monomoraic particle /-to/ (e.g., /pi.ka.ri.to/ and /zu.ba.ri.to/).

(7) a. pi.ka→ pi.ka.pi.ka 'shiny'

b. ba.sa→ba.sa.ba.sa 'loose'

c. su.be→su.be.su.be 'smooth, slippery'

d. ke.ba→ke.ba.ke.ba 'showy'

These mimetics become 'emphatic' when a consonant gets geminated, the pattern of gemination being a complex one. Based on the pattern of gemination Nasu (1999a) classifies emphatic mimetics into two groups: the consonant of the second syllable is geminated when it is voiceless and that of the third syllable is geminated if that (the consonant of the third syllable) is voiceless as rendered clear in (6):

(8) a. pi.ka.pi.ka→pik.ka.pika

ba.sa.ba.sa→bas.sa.ba.sa

b. su.be.su.be→su.bes.su.be

ke.ba.ke.ba→ke.bak.ke.ba

However, the pattern gets slightly more complicated when both the second and third syllables have voiced consonants. In this case too, it is the consonant of the second syllable – seemingly the default case – which is geminated as seen in (9):

(9) zu.ba→zu.ba.zu.ba→zub.ba.zu.ba

da.bu→da.bu.da.bu→dab.bu.da.bu

In addition to the other constraints, we borrow the following from Kubozono, 2003 to account for the patterns under Emphatic Mimetics:

(8) a. No Voiced Geminate: (NoVoiGem): *Geminate Consonants must be voiceless.*

b. Realize Morpheme (RM): *Every morpheme in the input must receive a phonological realization.*

The two constraints are undominated and are not ranked with respect to each other. The analysis is presented below. (We ignore the analysis of nonemphatic forms):

Emphatic form with an LH pattern:

/su.be.su.be/ + Morpheme 'smooth emph.'	No Voiced Geminate	Realise Emphatic Morpheme	* L H	Align-L	Parse- σ	Dep- μ

a. (su.be) (su.be)		*!		**		
b. (sub) (be.su) be	*!			*	*	*
c. ☞ su (bes) (su.be)			*	***	*	*
d. (su.be) (sub) be	*!			**	*	*

Tableau 13

Candidates (b) and (d) involve gemination of the voiced bilabial stop and therefore violate the undominated constraint, which disallows the presence of voiced geminates in Japanese. Candidate (c) violates *LH but in this case the violation does not rule candidate (c) out as it wins over candidate (a) because the latter lacks the emphatic morpheme (essentially a mora: coda consonant) and therefore violates undominated Realise Emphatic Morpheme while the former does not. Crucially, the downscaling of *LH in the constraint hierarchy enables us to account for this fact, which seems like an aberration at first glance.

Emphatic form with an HL pattern: (voiceless geminates)

/pi.ka.pi.ka/ + Morpheme 'shiny emph.'	No Voiced Geminate	Realise Emphatic Morpheme	*LH	Align-L	Parse- σ	Dep-μ
a. (pi.ka)(pi.ka)		*!		**		
b.☞ (pik)(ka.pi)				*	*	*

ka						
c. pi (kap) (pi.ka)				**!*	*	*
d. (pi.ka)(pik)ka				**!	*	*
e. (pik)ka(pik)ka				**!	**	*

Tableau 14

Candidate (a), lacking the emphatic morpheme, is subtracted from the equation. Candidates (c), (d) and (e) incur superfluous violations of Align-L while candidate (b), which violates Align-L only once, emerges optimal.

Emphatic Mimetics with a HL pattern (voiced geminates)

/zu.ba.zu.ba/ plus morpheme	No Voiced Geminate	Realise Emphatic Morpheme	*LH	Align -L	Parse-σ	Dep-μ
a. (zu.ba)(zu.ba)		*!		**		
b.☞ (zub)(ba.zu)ba	*			*	*	*
c. zu (baz) (zu.ba)	*			**!*	*	*
d. (zu.ba)(zub)ba	*			**!	*	*
e.(zub)ba(zub)ba	*			**!	**	*

Tableau 15

An interesting case where all candidates violate an undominated constraint, candidates (b) through (e) violate NoVoicedGeminate while (a) violates Realise Emphatic Morpheme and is ruled out. Once again, candidates (c) through (e) stack more violations of Align-L as compared with candidate (b), which emerges optimal.

8. Concluding Remarks

While still keeping the analysis, which can controvert the universality of the Iambic-Trochaic Law, we have still been able to account for the HL-LH asymmetry displayed in Kubozono (2003). In fact, as our desiderata demanded, we have done only better by reducing the number of constrains participating in re-ranking and tying them to the correlates of a prosodic category, namely the weight of a syllable.

To sum up: if head syllable is heavy, NonFinality – as a single constraint – is "virtually" undominated (*LH applies vacuously in such cases) and is inviolable. The ranking between Align-L and Parse- σ underlies the weight of second syllable therefore making constraint re-ranking the business of both the head (which constrains the non-head) and the non-head.

When the initial syllable is light, *LH makes sure that the only possible second syllable will be another L even at the cost of violating the syllable clause of NonFinality. But since *LH is very much 'active' in this case and ranked above NonFinality, this entails no problems.

There are residual issues such as the representation of #HL# structures, which we have left behind although it is theoretically possible to (a) accommodate H into a foot and leave L unfooted; or (b) build a degenerate foot over L after footing H. Technically at least the implementation seems plausible (Duanmu, 2005). We hope to return to these, as well as other related issues, in the future.

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