24.961 OT-3: Positional Faithfulness, Constraint Conjunction, Global Comparison

[1] **Positional Faithfulness**: in many languages contrasts are restricted to particular positions

- Initial vs. non-initial syllables
- Stressed vs. unstressed syllables
- Roots vs. affixes
- ranking schema is Ident-[F]position » M » Ident-[F]

McCarthy TGOT p. 88. Nancowry like French has a contrast between oral and nasal vowels but nasal vowels are restricted to stressed syllables, which are root final. Given Richness of the Base there could be an input with a nasal vowel in the unstressed syllable; but it can be mapped to oral if faithfulness for nasality in the stressed syllable dominates *V̰, which dominates general Ident-[nasal]:

Ident-[nasal]$_{\text{ˈσ}}$ » *V̰ » Ident-[nasal]

/batã/	Ident-[nasal]$_{\text{ˈσ}}$	*V̰	Ident-[nasal]
> baˈtã		*	
baˈta	*!		*
/bãta/			
> baˈta			*
bãˈta		*!	

It is important to realize that the positional restriction is defined in terms of output properties; it is only the feature mentioned in Ident-[F] whose input correspondent is being assessed. Stress in Nancowry is apparently predictable and not necessarily recorded in the input.

[2] initial in root (Beckman 1997)

- In Shona five vowels appear in the initial syllable of root but in noninitial syllables we find mid vowels only when they arise from harmony to initial vowels in the root
- Root + applicative

Base	Applicative/causative	
ip-a	ip-er-a	‘be evil’
bvum-a	bvum-is-a	‘jump’
shamb-a	shamb-is-a	‘wash’
vav-a	vav-ir-a	‘itch’

per-a	per-er-a	‘end’
son-a	son-er-a	‘sew’
om-a	om-es-a	‘be dry’

- root shapes: *C{i,u,a}C{e,o}C *C{e,o}C{i,u}C[1]

bover-	fungat-
vereng-	simuk-
nonok-	katuk-
zendam	kwazis-

Ident-[high]$_{\#\sigma}$ » *[-high,-low] » Ident-[high]

/kwazIs/	Ident-[high]$_{\#\sigma}$	*Mid	Ident-[high]
> kwazis			
kwazes		*!	

/per-a/	Ident-[high]$_{\#\sigma}$	*Mid	Ident-[high]
> pera		*	
pira	*!		*

Harmony: *[-low, αhigh] Co [-low, -αhigh]

Harmony » *Mid

/verIng/	Harmony	*Mid	Ident-[high]
> vereng		**	
vering	*!	*	

Ident-[high]initial-syllable

/verIng/	Ident-[high]$_{\#\sigma}$	*mid
> vereng		**
vireng	*!	*
viring	*!	

[1] We abstract away from the fact that there is no harmony between e + u (cf. svetuk-a).

- Faithfulness to the initial syllable prevents mid vowels from appearing in noninitial syllables except when the initial syllable itself is mid; harmony is enforced to mid rather than high by faithfulness to the initial syllable

[3] root vs. affix resolution of V-V in Lardil and Kaqchikel: Max-V root » Max-V

/mela-in/ -> mela-n /ki-oj/ -> k-oj

Constraint conjunction: banning the "worst of the worse" (Smolensky 1995)

- F » M for property 1 and F » M for property 2; but when both marked properties occur together in some local domain then the structure is ill-formed

example 1: cross-linguistically

*[+voice] » *[−voice] in obstruents: p > b

*geminate » *consonant: p > pp

- Yamato Japanese: t, tt, d, *dd

  mata 'again', mado 'window', mattaku 'precisely', *madda…

  Ident-[voice] » *[+voice], Ident-[length] » *geminate (= length in cons
- conjunction of two marked properties is worse than each taken singly

  *[+voice] & *geminate (domain: segment)
- a violation is assessed only if each conjunct is violated

	$\{*[+\text{voice}]\ \&\ *\text{geminate}\}_{\text{cons}}$	Ident-[voice]	Ident-[length]
mata			
mado	* & √		
mattaku	√ & *		
madda	* & * !		

- so no change is compelled in mata, mado, mattaku but is in hypothetical madda
- Nishimura (2003) and Kawahara (2006) show that the dispreference for voiced geminates shows up in loanword adaptation in combination with Lyman's Law

bug > [bagu] egg > [eggu] but bag > [bakku] ≈ baggu

example 2: palatal segments block pharyngeal harmony in Palestinian Arabic (DOT 216)

- pharyngealization implemented by retraction of Tongue Root [RTR]
- this gesture is antagonistic to raising or fronting the tongue body

- loanwords from French into Moroccan Arabic: when French vowel is back or low a neighboring consonant is pharyngealized (Kenstowicz & Louriz 2010)

style	[stil]	'style'
blouse	[bluz-a]	'blouse'
veste	[fist-a]	'jacket'
tôle	[ToL-ɑ]	'sheet iron'
glace	[Lɑ-gLɑS]	'ice cream'

- *[RTR, −back], *[RTR, +high]
- Palestinian dialect (Davis 1995)

/Ti:n-ak/	[Ti:nak]	'your mud'
/Tu:b-ak/	[Tu:Bɑk]	'your blocks'
/Se:f-ak/	[SeFɑk]	'your sword'

- (DOT p. 216)

(59) Insufficiency of the constraint set without local conjunction

	Inputs	Winners	Losers	*RTR/FRONT	*RTR/HIGH	ALIGN-R
a.	/tˤi:n-ak/	tˤi:nak	tˤiˤ:nˤaˤkˤ	W	W	L
b.	/sˤe:f-ak/	sˤeˤ:fˤaˤkˤ	sˤe:fak	L		W
c.	/tˤu:b-ak/	tˤuˤ:bˤaˤkˤ	tˤu:bak		L	W

Winners	Losers	[*RTR/FR & *RTR/HI]$_{seg}$	ALIGN-R	*RTR/FR	*RTR/HI
tˤi:nak	tˤiˤ:nˤaˤkˤ	W	L	W	W
sˤeˤ:fˤaˤkˤ	sˤe:fak		W	L	
tˤuˤ:bˤaˤkˤ	tˤu:bak		W		L

example 3: English coda clusters:

ramp	rant	rank
lam<b>	land	lon<g>

- cross-linguistically:
  - *[+voice] » *[−voice] in obstruents
  - *labial, dorsal » *coronal
    - (cf. coronal obstruents in E inflection; optimal oral epenthetic consonant (Fr. blabla, blablater)
  - *Complex-Coda » Simple-Coda

- analysis:

  {*[+voice] & *[lab,dors] & *Complex}$_{coda}$ » Ident [+voice]

	{*[+voice] & *[lab,dors] & *Complex}$_{coda}$	Ident [+voice]
ramp	√ & * & *	
rib	* & * & √	
ramb	* & * & *	

- here repair is deletion rather than more minimal devoicing perhaps because nasal+voiceless stop is a relatively marked cluster
- a domain is needed to restrict the locus of violation: both coda consonants and voiced obstruents are individually marked and so the German ban on voiced codas may be treated as conjuction [+voice] & No-Coda within the domain of a segment; it would be unusual to have domain of syllable or word banning a coda consonant and a voiced obstruent yielding a state of affairs where [mab] and [ba] are good but [bad], [bat], [ban] are not
- self-conjunction has been used to formalize constraints like Lyman's Law in Japanese that bans two or more voiced obstruents in a morpheme (Ito & Mester 2002)
- constraint conjunction is a powerful device that must be restricted: it typically involves markedness relations along a phonetic scale (Flemming 24.964, 2012): for example closure voicing duration: *long voiced closure duration » *short voiced closure duration

Global Comparison

rule-based derivations:

- prosodic structure is built bottom-up: segments parsed to syllables, syllables to feet, feet to Prosodic Word
- stress patterns, tonal melodies mapped from left-to-right/right-to-left
- cyclic word structure: derivation proceeds inside-outwards

challenges (Prince & Smolensky 1993)

- rules look ahead of themselves
- top-down effects
- structurally remote candidates

example 1: Tongan syllable structure and stress (Prince & Smolensky 1993)

- long vs. short vowel contrast
- stress: bimoraic trochaic foot aligned with right edge (Mester 1994)
- in most languages (e.g. Latin) a word-final heavy + light sequence is parsed (H)L

  (ta.ta) (ta:)ta (tan)ta
- but in Tongan a long vowel is split to satisfy foot alignment

  ma.áma 'world' húu 'open'

  hu.úfi 'open officially'
- modeled as subordination of syllabic structure (Onset) to Metrical Foot Form
- align the right edge of a bimoraic foot with the right edge of the prosodic word

/huu/	Align Bimoraic Foot Right	Onset
> (huu)		
(hu.u)		*!
/huu-fi/		
> hu(ufi)		*
(huu).fi	*!	
huu(fi)	*!	

- top-down effect: higher-level foot structure requirements determine lower-level syllabification given that a metrical foot is parsed by syllables
- derivational analysis (Poser): splits long vowels everywhere, parse stress foot, recompose long vowel except where second mora is stressed

example 2: Hindi Peak Prominence Stress (Prince & Smolensky 1993: "Kelkar's" Hindi)

ka:rí:gari:	'craftsmanship'	rightmost nonfinal heaviest syllable
ʃó:xjaba:ni:	'talkative'	
ré:zga:ri:	'small change'	
samíti	'committee'	ties
qísmat	'fortune'	
ro:zá:na:	daily	
ró:zga:r	'employment'	
a:smánja:h		
á:smã:ja:h	'highly placed'	variant
kid^{h}ár	'which way'	final stress
rupiá:	'rupee'	

janá:b 'sir'
musalmá:n 'Muslim'
inqilá:b 'revolution'

- in bottom-up derivation when syllables are organized into feet and nonfinal but rightward stress is desired, the classic analysis (Hayes 1982) posits a rule of "extrametricality" that excludes the final syllable from the foot parse
- the problem the Hindi data present is that extrametricality must be suspended just in case the final syllable is heaviest in the word;
- but we don't know if it is heaviest unless we have in effect already computed the stress by comparing the other syllables in the word for weight
- rule of extrametricality looks ahead of itself
- OT analysis: stress rightmost heavy syllable; in case of a tie, stress rightmost nonfinal

Syllable weight hierarchy: CVVC > CVV, CVC > CV

Peak-Prominence: *ˈCV » *ˈCVV,*ˈCVC » *ˈCVVC

Peak-Prominence » Nonfinality » Rightmost

/musalmaan/	*ˈCV	*ˈCVV,*ˈCVC	*ˈCVVC	Nonfinality	Rightmost
> σσˈσ			*	*	
σˈσσ		*!			σ#
ˈσσσ	*!				σσ#

/samiti/	*ˈCV	ˈCVV,ˈCVC	ˈCVVC	Nonfinality	Rightmost
> σˈσσ	*				σ#
σσˈσ	*			*!	
ˈσσσ	*				σσ#

/aas.mãã.jaah/	*ˈCV	ˈCVV,ˈCVC	ˈCVVC	Nonfinality	Rightmost
> ˈσσσ			*		σσ#
σˈσσ		*!			σ#
σσˈσ			*	*!	

example 3: Structurally remote substitution: Yidin stress (TGOT after Dixon, Hung)

trochaic parse: (SW)(SW)(S), (SW)(SW)(SW) (Maranungku, Cairene Arabic..
iambic parse: (WS)(WS)W, (WS)(WS)(WS) (Yupik, Choktaw….
S = Strong, W = Weak

trochaic feet

(gáliN) 'go' present
(gúda)(gágu) 'dog'
(wúNa)(bá:jiN) 'hunt' antipassive
(májin)(dáNa)(ñúnda) 'walk up'

iambic

(galbí:) 'catfish'
(bargán)(dají:n) 'pass by'
(magí)(riNál)(dañú:n)da 'climb up'

- descriptive generalization: long vowel attracts stress; rhythm is adjusted to accommodate a stressed long vowel
- Weight to Stress: if syllable is heavy then it is stressed
- *(Weak Strong) » *(Strong Weak) (i.e. *iambic » * trochaic)
- metrical structure is basically trochaic (trochaic default) but will switch to iambic to accommodate a long vowel

/galbi:/	Weight-to-Str	*(Weak Strong)
> (galbí:)		*
(gálbi:)	*!	
/gudagagu/		
> (gúda)(gágu)		
(gudá)(gagú)		*!
/wuNaba:jiN/		
> (wúNa)(bá:jiN)		
(wuNá)(ba:jín)	*!	
(wuNá)(bá:jiN)		*!

- remote interaction: other feet adjust to local change accommodating length

/magiriNaldañu:nda/	Weight-to-Str	*(Weak Strong)
> (Ss)(Ss)(sS:)s		*
(sS)(sS)(sS:)s		***
(Ss)(Ss)(Ss:)s	*!	
(sS)(Ss)(sS:)s		**
(Ss)(sS)(sS:)s		**

*Lapse: penalize two successive unstressed syllables

/magiriNaldañu:nda/	Weight-to-Str	*Lapse	*(Weak Strong)
> (sS)(sS)(sS:)s			
(Ss)(Ss)(sS:)s		*!	

- since OT constraints work over fully formed candidates, a change in ranking can lead to a radical shift in the character of the output; under a derivational, rule-based model only minimal, locally defined changes are expected

example 4: prosodically driven infixation (Prince & Smolensky 1993): Prosody » Morphology

Tagalog	aral	um-aral
	sulat	s-um-ulat
	gradwet	gr-um-adwet

- No-Coda » Align-affix
- Halle (2001) proposes alternative analysis of Onset Metathesis[2]

[5] **OT: outstanding problems**

overgeneration:

example 1: Final Devoicing is canonical repair to *b#, never deletion (Lombardi, Steriade)

some notion of minimal change is needed

example 2: cluster simplification (Côté 2000, Wilson 2001)

Diola Fogny: /let-ku-jaw/ lekujaw 'they won't go'

Korean: /kaps/ kap 'price'

/let-ku-jaw/	No Coda	Max-C
letkujaw	*!	
lekujaw		*
letujaw		*

[2] Buck Fush T-shirts sold during Republican Convention NYC 8/04; Kuck Ferry, Cluck Finton, Cuck Flinton?

Tibetan: /gzig/ zig 'one' cf. zug.zig 'eleven'

- generalization: the consonant that survives deletion is the one that has the most acoustic cues: cues to place of articulation in stop's burst are most robust before a vowel and tend to be masked before a stop: hence VCCV -> V<C>CV (where <C> = unparsed, deleted consonant)
- in an edge cluster the consonant closest to the vowel benefits from formant transition cues from the vowel to identify its place of articulation features (Steriade 2009)
- research question: under classical phonological theory such rich phonetic detail is not present in the input and perhaps only supplied in a post-phonological phonetic component
- do we abandon this assumption and allow a rich input with full phonetic detail? (cf. Stampe's critique of archiphoneme: UR is a sound not an abstraction like a feature matrix)
- Steriade's position is actually that OT grammar does not refer directly to auditory cues; rather the cues define a scale of perceptibility based on linguistic experience; this extra-grammatical P-map is used to project constraints into CON that operate over discrete representations; nevertheless the number of phonological categories is larger than what is traditionally envisioned in more classical versions of generative grammar including OT encompassing such noncontrastive properties as stop release
- the number of credible examples of remote interaction is not large; phonology seems fundamentally local; classical OT seems to miss this basic feature of grammar

undergeneration:

Opacity; the classical model of OT has no mechanism to deal directly with this pervasive feature of language;

proposals to introduce a restricted degree of serialism in the input-output mapping:

- Kiparsky's Lexical Phonology OT (Kiparsky 2000) has classic one-step OT modules defined over a feed-forward derivation defined in terms of the morphology: root > stem > word > phrase; each module can have different constraint rankings
- McCarthy's (2008) Harmonic Serialism allows for repeated GEN > EVAL cycles in which a minimal modification is made at each step; the derivation gradually converges on the optimal output form; a single constraint ranking imposes a uniform faithfulness-markedness distinction

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