

Optimality, Alignment and Polish Stress

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LSA, Boston, January 1994

0. Special thanks

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1. Polish stress, procedurally

Rubach and Booij 1985 -- their mot, phrase = PW, CG

Main stress: penultimate syllable of PW (i.e. final trochee)
-- monosyllables do have stress
-- some exceptions, see below and Idsardi 1994a

Secondary stress: iterative trochees
-- L to R on PW
-- L to R on proclitics
-- R to L on enclitics

(1) [CG (òò)→ [PW (òò)→ (óó) PW] ←(òò) CG]

- Enclitic stress never affects PW stress
-o, -òo, -oòo, -òòòo, etc.
- But interference between proclitic and PW stressing:

(2)			Proclitics	
PW	0	1	2	3
2	óó	o-óó	òo-óó	òoo-óó
3	oóó	ò-oóó	òo-oóó	òòò-oóó
4	òóóó	ò-oóóó	òo-òóóó	òoo-òóóó
5	òooóó	ò-oòóóó	òo-òooóó	òoo-òooóó
6	òoòóóó	ò-ooòóóó	òo-òoòóóó	òoo-òoòóóó
7	òòòóóóó	ò-ooòóóóó	òo-òòòóóóó	òoo-òòòóóóó

- polysyllabic proclitic strings retain PW stressing, except:

(3) proclitic stress can't disturb main stress 1-2, 3-2, etc.:
do dómu 'to the house'
(but some effects with monosyllabic PWs)

(4) initial "free element" in 3 syllable PWs 3-3:

Jàk on by Jankówi powiedział 'if he had told John'

(5) "domino" reparsing with second syllable PW stress in 1-5:

dò saksòfonisty 'to the saxophone'

(6) no "domino" effect in longer forms, instead a double dactyl pattern occurs in 1-7, 1-9, etc.; 3-5, 3-7, etc.:

òd konstanty nopòlitanczy ka 'from the Constantinopolites'

2. Optimality theory

Prince and Smolensky 1993, McCarthy and Prince 1993a,b, etc.

- Violable, ranked constraints

Gen(input) = { candidates }

Eval({ candidates }) = output

For Polish (MP 1993b)

- Ft-Form(Trochaic) (unviolated)
- Ft-Bin -- feet must be binary (violated in monosyllables)
- Parse-Syll -- Parse all syllables into feet (violated to meet Ft-Bin)

A constraint conflict -- Parse and FtBin for trisyllabic forms

(7)

Candidates	Ft-Bin	Parse-Syll
☞ (oo)o		*
☞ o(oo)		*
(oo)(o)	*!	
(o)(oo)	*!	
(o)(o)(o)	*!**	
ooo		**!*
...		

- Conflict resolved -- Ranking: FtBin >> Parse-Syll, those meeting FtBin "survive" (indicated by ☞)
- Multiple violations worse than single violation, e.g. (o)(o)(o) worse than (o)(oo); ooo worse than o(oo)

3. Generalized Alignment (MP 1993b)

(8) Align(Cat1, Edge1, Cat2, Edge2) =_{def}

\forall Cat1 \exists Cat2 \ni Edge1 of Cat1 and Edge2 of Cat2 coincide

where $Cat1, Cat2 \in PCat \cup GCat$
 and $Edge1, Edge2 \in \{Right, Left\}$

Polish PW stress (i.e. uncliticized forms) MP 1993b:

- $Align(PW, R, Ft, R) = A1$
- $Align(Ft, L, PW, L) = A2$
- $A1 \gg Ft\text{-Bin}$ -- stressed monosyllables
- $A1$ produces the non-iterative final foot effect:

(9)

Candidates	A1	Ft-Bin	Parse-Syll
(oo)o	*!		*
☞ o(oo)			*
(oo)(o)		*!	
(o)(oo)		*!	
(o)(o)(o)		*!**	
ooo	*!		***

Possible ranking relations between Parse-Syll and A2:

- $A2 \gg Parse$ -- one foot (= non-iterative stress system)
- $Parse \gg A2$ -- any unparsed element(s) toward the right
- $Parse \gg A2$ produces an iterative parsing effect due to the gradient evaluation of constraint violations evaluated over each foot (Kirchner)

(10)

Candidates	A1	Ft1	A2	Ft2	Ft3
(oo) ₁ (oo) ₂ (oo) ₃ o	*!		**		****
☞ (oo) ₁ (oo) ₂ o(oo) ₃			**		*****
(oo) ₁ o(oo) ₂ (oo) ₃			**!*		*****
o(oo) ₁ (oo) ₂ (oo) ₃		*!			*****

- Upward alignment constraints--such as $Align(Ft, PW)$ --effectively complete the parsing the form as they specify where all feet are located; call this "upward completion"
- $Parse\text{-Syll} = Align(Ft, L, Ft, R)$ compare MP 1993b:18 on Peripherality Condition as $Align(\sigma, L, \sigma, R)$
 --Weak Local Parsing (Hayes 1993) as anti-alignment effect?

(11) Ft-Form(Trochaic), $A1 \gg Ft\text{-Bin} \gg Parse\text{-Syll} \gg A2$

- Ft-Form(Trochaic) unviolated
- $A1 \gg Ft\text{-Bin}$ -- stressed monosyllables
- $Ft\text{Bin} \gg Parse\text{-Syll}$ -- no clash
- $Ft\text{-Bin} \gg A2$ -- 3 syll words oóo, *òóo (cf. Tauya)
- $A1 \gg A2$ -- 3 syll words oóo, *óoo;

- final trochee rather than all L to R (cf. Wankumara)
- Parse-Syll >> A2 -- iterative footing

4. Predictions for clitic stress

Without further adornments, MP account of Polish stress would predict inside-out footing for cliticized words:

(12) [CG ←(òo) [PW (òo)→ (óo) PW] (òo)→ CG]

Such inside-out systems do occur, e.g. Cahuilla (Levin 1988)

(13) ... o (ò o) (ò o) [Stem (ó o) (ò o) ...

However, Polish is outside-in.

- Need more alignment statements
RR's iterative clitic stressing would be translated as Align(Ft,CG) constraints. But upward completion means only the highest upward constraint will have any effect.

5. Alternatives for Polish clitic stress

- partial constraint ordering (constraint blocks)
- level ordering (cyclic derivations)
- trans-derivational constraints
- recursive prosodic structure

a. Align(CG, Ft) statements

Align(CG, L, Ft, L) = A3

Align(CG, R, Ft, R) = A4

- A3, A4 must be ranked above A2 by upward completion
- We need five syllables of clitic material to prove Align(Ft,CG) instead of Align(CG,Ft).

(14) à on wàm by to zróbil 'and he would do it for you' *òooòo-óo

(15) Zábil sie bý on wàm tu 'he would have killed self here' *óo-òooòo

- Thus we require a way around upward completion
- Is five syllable clitic evidence available to the learner?

b. Constraint blocks

Align(Ft, L, CG, L) = A5

Align(Ft, R, CG, R) = A6

- block of upward alignment constraints: {A2, A5, A6}
- could add up aggregate violations, but
 - results in a tie for 2-5, and fails for 3-4 and 1-4

(16)

Candidates	A2, A5, A6	
	Ft1	Ft2
☞ (oo) ₁ -(oo) ₂ o(oo) ₃	**+0+*****	0+**+***
(oo) ₁ -o(oo) ₂ (oo) ₃	**+0+*****	*+***+**
☛ o(o-o) ₁ (oo) ₂ (oo) ₃	*+*+*****	*+***+**

-- ☛ indicates an incorrect surviving candidate

(17)

Candidates	A2, A5, A6	
	Ft1	Ft2
(oo) ₁ (o-o) ₂ o(oo) ₃	***+0+*****!	*+***+**!
(oo) ₁ o-(oo) ₂ (oo) ₃	***+0+*****!	0+***+**
☛ o(oo) ₁ -(oo) ₂ (oo) ₃	**+*+*****	0+***+**

(18)

Candidates	A2, A5, A6
	Ft1
(o-o) ₁ o(oo) ₂	*+0+**!
☛ o-(oo) ₁ (oo) ₂	0+*+**

- add Align(CG, L, Ft, L) >> Parse
- could find minimal violation within block for each foot, but
 - still have to resolve ties, as in (18)
 - aligning to both edge of CG entails extras in the middle
- could restrict PW alignment to items "within" PW, but
 - this loses the Cahuilla account
 - still have alignments to both CG edges
- block must be ranked below Parse for upward completeness
 - generates domino effect parsing in 1-5:

(19)

Candidates	Parse
☞ (o-o)(oo)(oo)	
(o-o)oo(oo)	*!*
o-(oo)o(oo)	*!*

-- but incorrectly predicts no double dactyl parsings,
as there are alternatives without Parse violations, 1-7:

(20)

Candidates	Parse
(o-o)o(oo)o(oo)	*!*
(o- o)(oo)(oo)(oo)	

c. Level ordering

- Outside-in pro- and enclitic alignments entails 3 levels:

(21) Gen(Eval(Gen(proclitics + Eval(Gen(PW)))) + enclitics)

- by itself predicts no "intrusions" by later metrifications -- OK for enclitics,
 - predicts double dactyls for proclitics
 - does not predict domino effects in proclitics
 - misses directional generalization over PW and proclitics
- similar alternative -- Burzio's metrical consistency trans-derivational constraint
- need new constraint for consistency between levels, which counts the degree of mismatch between the two levels, call this Level-Faithfulness. Two kinds of violations:
 - new feet where none exist on previous level
 - no feet where old feet are present on previous level

For proclitics:

- Parse >> LevelFaith(new) -- odd + 3 cases
- LevelFaith(old) >> Parse -- otherwise no double dactyls

d. Recursive prosodic structure

Combine ideas behind constraint blocks and level ordering

- proclitics as recursive PWs (Selkirk 1993, MP 1993a,b):

(22) [CG [PW (òò)→ [PW (òò)→ (óó) PW] PW] ←(òò) CG]

- CG level now only for enclitics
 - fully faithful to previous level
- Align(PW) is now ambiguous due to recursive PWs

- feet wholly inside both PWs will align correctly with either PW, forming a well-behaved set
- feet wholly outside inner PW must align with outermost PW
 - otherwise inside-out stressing occurs
 - acts like level-ordering
 - consistent with some recursive evaluation

(23) A violation counting principle: Count upward alignment violations w.r.t. minimal containing category
 -- i.e. upward alignments are evaluated upward

- then Cahuilla recursion can be mirror image of Polish:

(24) $[CG \leftarrow (\text{òó}) [PW [PW (\text{óó}) \rightarrow PW] (\text{òó}) \rightarrow PW] CG]$

- what about feet straddling PWs?
 - domino versus double dactyl effects
 - reparsing only with first proclitic foot
 - exactly diff between $\text{Align}(PW, Ft)$ and $\text{Align}(Ft, PW)$
 - therefore, conflicts will arise with mono-syllabic proclitics, because alignment must be to every PW

(25)

	Candidates	Align(PW,L,Ft,L)	
		PW1	PW2
☞ a.	$[_1(o [{}_2 o) o(oo)]]$		*
b.	$[_1 o [{}_2(oo)(oo)]]$	*!	

- violations only counted for first foot
- [,] mark PW boundaries

- misalignments to PW1 should outweigh misalignments to PW2

(26) Principle: downward alignments are evaluated downward

(27) Ranking: Ft-Form(Trochaic), $\text{Align}(PW, R, Ft, R)$

- >> Ft-Bin
- >> $\text{Align}(PW, L, Ft, L)$
- >> Parse-Syll
- >> $\text{Align}(Ft, L, PW, L), \text{Align}(Ft, R, CG, R)$

- $\text{Align}(PW, L, Ft, L)$ >> Parse-Syll will allow double dactyl effects when there is enough material for two feet to be imposed by $\text{Align}(PW, L, Ft, L)$, i.e. with hosts of 4 or more syllables and proclitics of 2 or more syllables.
- In other cases domino effects will occur, e.g. 1-5 and 3-3

6. An ordering paradox with exceptional stress

3 classes of exceptional stems: final (menú), antepenultimate (uniwérsytet) and stems that have penult stress by themselves, but antepenultimate stress with a single syllable suffix (repúblik/repúblika/republikámi)

- exceptional stresses do not show up as secondary stresses (cf. Manam, Buckley 1993; Old English, Idsardi 1994b)

(28) gramátyka

(29) gramatykámi *gramàtykámi

- Idsardi 1992 theory of lexical stress as idiosyncratic metrical boundaries--e.g. gramatyk)--could be translated into OT/GA as idiosyncratic Alignment statements.
(cf. infixation in OT/GA, e.g. for Ulwa -ka- infix, MP 1993b page 2 employ $\text{Align}([ka]_{Af,L}, Ft', R)$).

(30) $\text{Align}(\{\text{gramatyk, republik, etc.}\}, R, Ft, R) = AG$

- $AG \gg A1$ -- exceptions to main stress location
- $A2 \gg AG$ -- not exceptions to secondary stress location
- $A1 \gg A2$ -- main stress still penultimate in 3 syll words
- Therefore $AG \gg A1 \gg A2 \gg AG$ -- paradox