Dominance in Inflectional Paradigms

Melissa Frazier
University of North Carolina – Chapel Hill
melfraz@email.unc.edu

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1. Introduction

(1) morphologically related words can show surprising phonological similarities and dissimilarities ("surprising" = not predicted by a ranking of only markedness and IO-faithfulness constraints)
How do we formalize these relationships?
assuming a fully parallel OT:

a.

	similarity	dissimilarity
derivation	OO-faithfulness	¬OO-antifaithfulness
inflection	OP-faithfulness	???

b. OO-faithfulness constraints (Benua 1997): compare derived word to base

c. ¬OO-antifaithfulness constraints (Alderete 1999): triggered by dominant affixes (those affixes that cause a base-mutation), demand violation of faithfulness

d. Optimal Paradigms (OP)-faithfulness constraints (McCarthy 2005): compare (the stems of) members of an inflectional paradigm (with no base-priority)

e. *Is there evidence of dissimilarity in inflectional paradigms?*

(2) Proto-Indo-European (PIE) athematic nouns show evidence of dissimilarity among (the stems of) members of an inflectional paradigm

a. cannot be analyzed with ¬OO constraints because dominant affixes do not attach to stems that are actual outputs (words)

b. cannot be analyzed with REALIZEMORPHEME (Kurisu 2001) because the members of the paradigm display multiple differences, any of which would satisfy RM

c. a new type of antifaithfulness constraint can replace the ?s above: ¬OP antifaithfulness constraints

d. ¬OP constraints relate only the outputs of members of an inflectional paradigm: stems of members formed with a dominant inflectional affix are required to be different (in the specified way) from stems of members formed with a recessive affix

(3) summary of talk

a. PIE data
b. analysis of weak cases
c. ¬OP model
d. analysis of strong cases
e. discussion and conclusions

2. PIE Athematic Nouns and Accent

(4) morphological composition of a PIE athematic noun:
<u>root</u> + derivational <u>suffix</u> + inflectional suffix (<u>ending</u>)
R + S + E

(5) athematic nouns: four accent classes[1] (actual data in Appendix A)

	strong cases	weak cases
acrostatic	Ṟ́SE	Ṟ́SE
proterokinetic	Ṟ́SE	RŚ̱E
hysterokinetic	RŚ̱E	RSÉ
amphikinetic	Ṟ́SE	RSÉ̱

a. strong cases (nom, acc, voc) are distinguished from weak cases (dat, gen , instr, abl, loc) by placement of stress,

b. or by ablaut (for acrostatic nouns, roots have different vowel quality or length between strong and weak forms)

(6) summary of data

a. endings (E)
   i. endings are the same for each accent class

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[1] The holokinetic accent class and root nouns will not be discussed here. See Frazier (2006a) for their analysis with this system.

ii. UR proposals:
   weak endings: accented and *recessive*
   strong endings: unaccented and *dominant* (cause surprising dissimilarities in the stem/root to which they attach)
b. proposals about stems (RS)
   i. roots and suffixes can be underlying accented or unaccented – roots can also be post-accenting (Halle 1997)
   ii. any type of root can combine with any type of suffix (=6 possible stem types)
c. accent class is predictable given the UR of the stem (4 surface patterns created from 6 stem types)

3. Analysis of Weak Cases

(7) underlying/surface representations for weak cases

	UR	SR
acrostatic	ŔSÉ ŔŚÉ	ŔSE
proterokinetic	RŚÉ R$_{pa}$ŚÉ	RŚE
hysterokinetic	R$_{pa}$SÉ	RSÉ
amphikinetic	RSÉ	RSÉ

(8) faithfulness to underlying accent: MAX(ACCENT), DEP(ACCENT) (Alderete 1999)
   a. positional faithfulness (Beckman 1997) to a root: F$_{root}$
   b. head faithfulness (Revithiadou 1999) to a derivational affix: F$_{deriv}$
   c. ranking for PIE: F$_{root}$ » F$_{deriv}$ » F

(9) alignment constraints
   a. given no underlying accent, stress falls on leftmost morpheme – ALIGNL: for every stressed morpheme, align its left edge with the left edge of some PrWd
   b. post-accenting roots (R$_{pa}$) trigger POSTACCENT: for every post-accenting morpheme, align its right edge with the left edge of some stressed morpheme

(10) ranking that accounts for weak forms (tableaux in Appendix B):
   a. MAX(A)$_{root}$ » MAX(A)$_{deriv}$ » MAX(A) » ALIGNL, POSTACCENT » DEP(A)
   b. underlying accent is realized over general alignment preferences
   c. positional/head faithfulness determines which underlying accent is realized

4. Why ¬OP Constraints? and the ¬OP Model
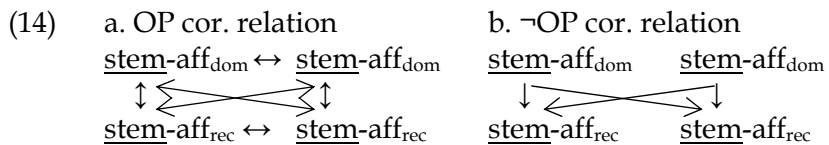
(11) strong endings must be dominant
   a. recessive endings make the wrong prediction:
      • acrostatic: ŔSE, ŔŚE → ŔSE   √
      • amphikinetic: RSE → ŔSE   √
      • hysterokinetic: R$_{pa}$SE → RŚE   √
      • proterokinetic: RŚE, R$_{pa}$ŚE → RŚE   X   cf. ŔSE
   b. ranking from (10a) predicts suffix stress in proterokinetic nouns for both strong and weak forms, but this is not the correct pattern
   c. preference for dissimilar stems between strong and weak forms (accent or ablaut)
   d. *dominant* affixes are those that cause a base-mutation and trigger antifaithfulness constraints (Alderete 1999)
   e. proposal: in the case of inflectional paradigms, dominant affixes cause a stem-mutation

(12) if strong endings are dominant…
   a. they can demand that the stems to which they attach be different from the stems inflected with recessive affixes
   b. they cannot trigger ¬OO constraints because there is no base (the stem is not a well-formed word)
   c. therefore, they trigger a new type of constraint designed for use in inflectional paradigms: the ¬OP-antifaithfulness constraint

(13) OP model (McCarthy 2005: 173-4) and proposed ¬OP model

OP a: "Candidates consist of entire inflectional paradigms, where an inflectional paradigm contains all and only the words based on a single lexeme."
¬OP a' : same as (a)
OP b: "Markedness and input-output faithfulness constraints evaluate all members of the candidate paradigm. The violation-marks incurred by each paradigm member are added to those incurred by all the others."
¬OP b' : same as (b)
OP c: "The stem (output form of the shared lexeme) in each paradigm member is in a correspondence relation $\Re_{OP}$ with the stem in every other paradigm member."
¬OP c' : The stem in each paradigm member that is formed with a dominant affix is in a correspondence relation $\Re_{\neg OP}$ with the stem in each paradigm member that is formed with a recessive affix.
OP d: "There is a set of output-output faithfulness constraints on the $\Re_{OP}$ correspondence relation."
¬OP d' : For every faithfulness constraint on the $\Re_{OP}$ correspondence relation, there is a corresponding antifaithfulness constraint on the $\Re_{\neg OP}$ correspondence relation.

(14)   a. OP cor. relation   b. ¬OP cor. relation

$$\underline{\text{stem}}\text{-aff}_{dom} \leftrightarrow \underline{\text{stem}}\text{-aff}_{dom} \qquad \underline{\text{stem}}\text{-aff}_{dom} \quad \underline{\text{stem}}\text{-aff}_{dom}$$

$$\underline{\text{stem}}\text{-aff}_{rec} \leftrightarrow \underline{\text{stem}}\text{-aff}_{rec} \qquad \underline{\text{stem}}\text{-aff}_{rec} \quad \underline{\text{stem}}\text{-aff}_{rec}$$

5. Analysis of Strong Cases with ¬OP constraints

(15) underlying/surface representations for strong cases

	UR	SR
acrostatic	ŔSE_{dom} ŔSE_{dom}	ŔSE
proterokinetic	RŚE_{dom} $\text{R}_{pa}\text{ŚE}_{dom}$	ŔSE
hysterokinetic	$\text{R}_{pa}\text{SE}_{dom}$	RŚE
amphikinetic	RSE_{dom}	ŔSE

(16) dominant affixes in PIE trigger ¬OP constraints that require accent placement to be different in stems of strong forms as compared to stems of weak forms
   a.   specifically, accent is inserted onto the stem of a strong form as compared to a weak form
   b.   ¬OP-DEP(A): Insert an accent into the stem of a member of an inflectional paradigm that is created with a dominant affix (as compared to a member of the same paradigm formed with a recessive affix).

(17) proterokinetic strong form: UR = RŚE_{dom}; SR = ŔSE
(stems are underlined, strong forms are in bold, superscript numerals denote correspondence relations between accents)

/RŚ^1/ + /E$_{dom}$ x9, É$^2_{rec}$ x15/	¬OP-DEP(A)	OP-DEP(A)	MAX(A)$_{deriv}$	MAX(A)	ALIGNL	DEP(A)
☞ **Ŕ^{3}SE x9** a R̲Ś^{1}E x15		* *135*	* *9*	* *24*	* *15*	* *9*
RŚ^{1}E x9 b R̲Ś^{1}E x15	*! *135*			* *15*	* *24*	
RŚ^{1}E x9 c R̲SÉ^2 x15		* *135*	*! *15*	* *15*	* *24*	

¬OP-DEP(A) » OP-DEP(A), MAX(A)$_{deriv}$ (accent must be inserted onto the stem of a word formed with a dominant affix, even if that means accent is deleted from a derivational affix)

(18) for the other type of proterokinetic noun (UR = R$_{pa}$Ś), high-ranking ¬OP-DEP(A) still forces accent to be deleted from the suffix and inserted onto the root in strong forms

(19) amphikinetic strong forms: UR = RSE$_{dom}$; SR = ŔSE

/RSE$_{dom}$/		¬OP-DEP(A)	ALIGNL	DEP(A)$_{root}$	DEP(A)$_{deriv}$	DEP(A)
RS	a ☞ <u>ŔSE</u>			*		*
	b <u>RŚE</u>		*!		*	*
	c <u>RSÉ</u>	*!	*			*

ALIGNL » DEP(A)$_{root}$ (leftmost accent is preferred, even if that means accent is inserted onto a root)

(20) hysterokinetic strong forms: UR = R$_{pa}$SE$_{dom}$; SR = RŚE

/R$_{pa}$SE$_{dom}$/		¬OP-DEP(A)	POST ACC	ALIGNL	DEP(A)
RS	a ☞ <u>RŚE</u>			*	*
	b <u>ŔSE</u>		*!		*
	c <u>RSÉ</u>	*!	*	*	*

POSTACCENT » ALIGNL (it is more preferable for accent to occur after a post-accenting morpheme than on the leftmost morpheme)

(21) acrostatic strong forms: UR = ŔSE$_{dom}$ or RŚE$_{dom}$; SR = ŔS

a.

/Ŕ^{1}SE$_{dom}$/		MAX(A)$_{root}$	¬OP-DEP(A)	MAX(A)	ALIGNL	DEP(A)
Ŕ^{1}S	a ☞ <u>Ŕ^{1}SE</u>		*			
	b <u>RŚ^{2}E</u>	*!		*	*	*

b.

/Ŕ^{1}Ś^{2}E$_{dom}$/		MAX(A)$_{root}$	¬OP-DEP(A)	MAX(A)$_{deriv}$	MAX(A)	ALIGNL
Ŕ^{1}S	a ☞ <u>Ŕ^{1}SE</u>		*	*	*	
	b <u>RŚ^{2}E</u>	*!			*	*

MAX(A)$_{root}$ » ¬OP-DEP(A) (accent cannot be deleted from a root, even if that means no accent is inserted onto the stem of a word

formed with a dominant affix)

(22) summary:
  a. MAX(A)$_{root}$ » ¬OP-DEP(A) » MAX(A)$_{deriv}$ » MAX(A) » POSTACCENT » ALIGNL » DEP(A)
  b. underlying accent is never deleted from a root
  c. if the root is not underlyingly accented, ¬OP-DEP(A) insures that strong and weak forms will always be different in terms of accent
  d. given no underlying accent, accent is inserted onto the root (ALIGNL) or onto the suffix if the root is post-accenting (POSTACCENT)

(23) Why ¬OP-DEP(A)? – theoretical implications of ¬OP constraints
  a. other ¬OP constraints with respect to accent (¬OP-MAX(A), ¬OP-NOFLOP(A)) are not compatible with entire paradigms
  b. effective ¬OP constraints must dominate corresponding OP and IO faithfulness constraints, but...
  c. amphikinetic noun (stem type RS)

/RS/ + /E$_{dom}$ x9, É$^1_{rec}$ x15/	NOFL(A)	¬OP-NOFL(A)	ALIGNL	DEP(A)
a **Ŕ^{1}SE x9,** <u>RŚ^{1}E x15</u>	*! 15		* 15	* 9
b ☞ **Ŕ^{1}SE x9,** <u>RSÉ^1 x15</u>		* 135	* 15	* 9

NOFLOP(A) » ¬OP-NOFLOP(A)

  d. amphikinetic noun (stem type RS)

/RS/ + /E$_{dom}$ x9, É$^1_{rec}$ x14/	MAX(A)	¬OP-MAX(A)	ALIGNL	DEP(A)
a **Ŕ^{3}SE x9,** <u>RŚ^{2}E x15</u>	*! 15		* 15	* 24
b ☞ **Ŕ^{2}SE x9,** <u>RSÉ^1 x15</u>		* 135	* 15	* 9

MAX(A) » ¬OP-MAX(A)

  e. ¬OP constraints can affect paradigm members formed with recessive affixes because of simultaneous evaluation of all members of a paradigm as candidate sets

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6. Discussion and Conclusions

(24) implications for future work

a. accent:
   - the accentless vocative in Vedic Sanskrit: ¬OP-Max(A) (Frazier 2006b)

b. ablaut/umlaut:
   - ablaut in PIE acrostatic nouns (e.g. 'water' *nom sg* wódr̥ ~ *gen sg* wédn̥s): ¬OP-Ident[back] (Frazier 2006a:§5.1)
   - umlaut in German nouns (e.g. 'daughter' *sg* T[o]chter ~ *pl* T[ø]chter; 'foot' *sg* F[u]ss ~ *pl* F[y]sse): ¬OP-Ident[back] (see Iscrulescu 2006 for alternative approach)

(25) evidence of dissimilarity in inflectional paradigms motivates antifaithfulness constraints that work within the OP model - ¬OP constraints

a. like ¬OO antifaithfulness constraints, ¬OP constraints demand a violation of the appropriate OP constraint and work on a surface-surface correspondence relation

b. unlike ¬OO antifaithfulness constraints, ¬OP constraints are only triggered by inflectional affixes and apply to *stems* which do not need to be well-formed words

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Appendix A: Example Data

PIE athematic nouns (Schindler 1972, 1975a, b, Kim 2002, Fortson 2004)

accent class	gloss	strong (*nom sg*)	weak (*gen sg*)
acrostatic	*liver*	*yé:k^w-r̥-Ø	*yék^w-n̥-s
	water	*wód-r̥-Ø	*wéd-n̥-s
proterokinetic	*coming*	*g^{w}ém-tu-s	*g^{w}m̥-téw-s
	thought	*mén-ti-s	*mn̥-téy-s
hysterokinetic	*male*	*h$_2$rs-é:n (<**-én-s)	*h$_2$rs-n-és
	father	*ph$_2$t-é:r (<**-ér-s)	*ph$_2$tr-és
amphikinetic	*earth*	*d^{h}ég^h-o:m (<**-om-s)	*d^{h}g^h-m-és
	male	*h$_2$né:r (<**h$_2$nér-s)	*h$_2$nr̥-és

Appendix B: Tableaux for Weak Cases

(1) acrostatic noun (type ŔS) with weak ending

	/ŔSÉ/	MAX(A)$_{root}$	MAX(A)	ALIGNL
a	☞ ŔSE		*	
b	RSÉ	*(!)	*	*(!)

(2) acrostatic noun (type ŔŚ) with weak ending

	/ŔŚÉ/	MAX(A)$_{root}$	MAX(A)$_{deriv}$	MAX(A)	ALIGNL
a	☞ ŔSE		*	**	
b	RŚE	*(!)		**	*(!)
c	RSÉ	*(!)	*	**	*(!)

(3) amphikinetic noun (type RS) with weak ending

	/RSÉ^1/	NOFL(A)	MAX(A)	DEP(A)	ALIGNL
a	Ŕ^{2}SE		*(!)	*(!)	
b	Ŕ^{1}SE	*!			
c	☞ RSÉ^1				*

NOFL(A) » ALIGNL; {MAX(A), DEP(A)} » ALIGNL

(4) proterokinetic noun (type RŚ) with weak ending

	/RŚÉ/	MAX(A)$_{deriv}$	MAX(A)	ALIGNL
a	☞ RŚE		*	*
b	RSÉ	*!	*	*

(5) hysterokinetic noun (type R$_{pa}$S) with weak ending

	/R$_{PoA}$SÉ^1/	MAX(A)	NOFL(A)	POSTACC	ALIGNL	DEP(A)
a	RŚ^{2}E	*(!)			*	*(!)
b	RŚ^{1}E		*!		*	
c	☞ RSÉ^1			*	*	

NOFLOP(A), {MAX(A), DEP(A)} » POSTACCENT

(6) proterokinetic noun (type R$_{pa}$Ś) with weak ending

	/R$_{PoA}$ŚÉ/	MAX(A)$_{deriv}$	MAX(A)	POSTACC	ALIGNL
a	☞ RŚE		*		*
b	RSÉ	*(!)	*	*(!)	*

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