Accent in Proto-Indo-European Athematic Nouns and Its Development in Vedic Sanskrit

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18th Annual UCLA Indo-European Conference
November 3, 2006

1. Introduction

(1) accent alternations reconstructed for PIE athematic nouns (Pederson 1926, Kuiper 1942, Schindler 1972, 1975a-c) have not been satisfactorily accounted for with phonological theory
   a. Kiparsky and Halle (1977) and Halle (1997) lay a foundation for analysis, discussing underlying representations and applicable rules to derive the accent patterns
   b. Kim (2002) analyzes nouns with *metrical bracket theory* (Idsardi 1992), but can only account for protero- and hysterokinetic through morpheme reanalysis

(2) accent in athematic nouns can be analyzed with a constraint based system of phonology (Optimality Theory – OT (Prince and Smolensky 1993))
   a. this analysis can account for accent in athematic nouns in Vedic Sanskrit (with diachronically sensible modifications), including the accentless vocative
   b. smooth transition into Vedic supports analysis for PIE

(3) summary of talk
   a. the data
   b. analysis for PIE
   c. extension of analysis to Vedic Sanskrit
   d. implications and conclusions

2. Accent in Athematic Nouns

(4) Accent/Ablaut Patterns

		Root	Suffix	Ending
acrostatic	strong	**ó/é:**		
	weak	**é**		
proterokinetic	strong	**é**		
	weak		**é**	
hysterokinetic	strong		**é**	
	weak			**é**
amphikinetic	strong	**é**	**o**	
	weak			**é**

all blank boxes = morpheme realized with Ø-grade

(5) Example Data (Schindler 1972, 1975a, b, Kim 2002)

	accent class	gloss		
a.	acrostatic (root n.)	*foot*	strong	* pód-s
			weak	*péd-s
b.	acrostatic	*liver*	strong	* yé:kʷ-r̥-Ø
			weak	* yékʷ-n̥-s
c.	proterokinetic	*coming*	strong	* gʷém-tu-s
			weak	* gʷm̥-téw-s
d.	hysterokinetic	*male*	strong	*h₂rs-é:n (<**h₂r̥s-én-s)
			weak	* h₂rs-n-és
e.	amphikinetic (root n.)	*male*	strong	* h₂né:r (<**h₂nér-s)
			weak	* h₂nr-és
f.	amphikinetic	*earth*	strong	* dʰégʰ-o:m (<**dʰégʰ-om-s)
			weak	* dʰgʰ-m-és
g.	amphikinetic (holokinetic)	*earth*	loc sg	dʰgʰ-ém-Ø

strong = *nom sg*; weak = *gen sg*

3. Predicting Surface Accent in PIE

(6) using OT
   a. possible surface forms are compared simultaneously to a given UR
   b. a set of ranked constraints evaluates all possible surface forms and assigns violation-marks as applicable
   c. the surface form that "wins" has the least violation-marks for the highest-ranked constraints

(7) assumptions about underlying representations
   a. roots can be accented, unaccented, or post-accenting (Halle 1997)
   b. suffixes can be accented or unaccented
   c. any type of root can combine with any type of suffix = six different stem types
   d. weak endings are recessive/accented
   e. strong endings are dominant/unaccented (dominant affixes cause mutation in the base to which they are attached (Alderete 1999))
   f. because all nouns take the same endings, accent class is predictable given the UR of the stem

(8) CULMINATIVITY (every prosodic word must have one and only one accent): URs may contain more than one accent or none, but the surface form always has one (Kiparsky and Halle 1977)

(9) ¬OP constraint (Frazier 2006) – new type of antifaithfulness (Alderete 1999) constraint that requires dissimilarity in inflectional paradigms (based on McCarthy (2003)'s Optimal Paradigms)
   a. compare *stems* inflected with a dominant ending to *stems* inflected with a recessive ending within a paradigm
   b. require that stems inflected with a dominant ending do not match stems inflected with a recessive ending in the specified way

(10) the following ranked constraints predict the four accent patterns of the athematic nouns to surface given the six stem types available
   a. MAX(ACCENT)$_{root}$: do not delete underlying accent in a root
   b. ¬OP-DEP(ACCENT): realize a dominant ending by inserting accent into the stem (as compared to the same stem when inflected with a recessive ending)
   c. MAX(ACCENT)$_{deriv}$: do not delete underlying accent in a derivational affix
   d. MAX(ACCENT): do not delete underlying accent anywhere
   e. ALIGN (post-accenting morpheme, R, accented morpheme, L) = POSTACCENT: accent occurs on the morpheme following a post-accenting morpheme
   f. ALIGNLEFT (accented morpheme, prosodic word): accent occurs on the leftmost morpheme

(11) acrostatic
   a. UR = ŔS or ŔŚ; strong = ŔSE, weak = ŔSE
   b. an underlyingly accented root always surfaces with stress (MAX(ACCENT)$_{root}$)

(12) hysterokinetic
   a. UR = R$_{pa}$S; strong = RŚE, weak = RSÉ
   b. with weak ending, underlying accent on ending surfaces (MAX(ACCENT))
   c. with strong ending, accent is inserted onto suffix (POSTACCENT)
   d. dominant ending causes mutation (¬OP-DEP(ACCENT))

(13) amphikinetic
   a. UR = RS; strong = ŔSE, weak = RSÉ
   b. with weak ending, underlying accent on ending surfaces (MAX(ACCENT))
   c. with strong ending, accent is inserted onto root (ALIGNL)
   d. dominant ending causes mutation (¬OP-DEP(ACCENT))

(14) holokinetic – subtype of amphikinetic, with loc. sg. *-Ø
   a. UR = RS; loc sg = RŚ
   b. stress cannot fall on root in loc sg because dominant ending would not be realized (¬OP-DEP(ACCENT)), i.e. stem inflected with dominant ending (R̲Ś̲E) = stem inflected with recessive ending (R̲Ś̲)
   c. suffix stress is optimal

(15) proterokinetic
   a. UR = RŚ or R$_{pa}$Ś; strong = ŔSE; weak = RŚE
   b. with weak ending, underlying accent on suffix surfaces (MAX(ACCENT)$_{deriv}$)
   c. with strong ending, accent is deleted from suffix and inserted onto root (¬OP-DEP(ACCENT), ALIGNL)
   d. POSTACCENT cannot be satisfied because its satisfaction would lead to a ¬OP-DEP(ACCENT) violation

(16) summary: dominant endings that trigger ¬OP-DEP(ACCENT) predict accent alternations between strong and weak forms given any UR where the root is not underlyingly accented (according to the ranking in (10))

4. Accent in Vedic Sanskrit

(17) support for the analysis for PIE comes from an attested daughter language: Vedic Sanskrit
   a. accentless vocative can be analyzed with ¬OP constraints
   b. changes in constraint ranking are all diachronically reasonable

(18) accent in Vedic athematic nouns (Kiparsky 1973), ignoring vocative:

	columnar		alternating	
	marút- 'wind (god)'		pad- 'foot'	
	sg	pl	sg	pl
N	marút	marútas	pā́t	pā́das
A	marútam	marútas	pā́dam	padás
I	marútā	marúdbhis	padā́	padbhís
D	marúte	marúdbhyas	padé	padbhyás
Abl	marútas	marúdbhyas	padás	padbhyás
G	marútas	marútām	padás	padám
L	marúti	marútsu	padí	patsú

(19) analysis (Kiparsky 1984): strong endings are accented, weak endings are pre-accenting; Basic Accentuation Principle (BAP): leftmost accent wins

(20) analysis with constraints:
   a. MAX(ACCENT)$_{root}$: do not delete underlying accent in a root
   b. MAX(ACCENT): do not delete underlying accent anywhere
   c. ALIGNR (accent, stem): accent occurs in stem-final position
   d. undominated: CULMINATIVITY (every prosodic word must have at least one accent)

(21) "the vocative is accented only when it stands at the beginning of a sentence – or, in verse, at the beginning also of a metrical division or pāda; elsewhere it is **accentless** or **enclitic**." (Whitney 1898: 108, emphasis added)
   a. sentence initial: á̲g̲n̲e̲ yáṁ yajñáṁ paribhū́r ási
         Agni! whatever offering thou protectest
   b. elsewhere: úpa tvā ʽg̲n̲a̲ é ʽmasi
         unto thee, Agni, we come
   c. cf. nominative: a̲g̲n̲í̲ḥ̲ pū́rvebhir ṛ́ṣibhir; a̲g̲n̲í̲r̲ hótā kavíkratuḥ (Lubotsky 1997)

(22) status of the vocative can be explained if the vocative null ending is dominant and triggers ¬OP-MAX(ACCENT): requires

the deletion of accent from the stem of a noun inflected with a dominant ending as compared to the stem of a noun inflected with a recessive ending

   a. because vocative is *(en)clitic*, it is not a prosodic word (it "leans on" its host), and CULMINATIVITY does not require it to be accented

   b. when sentence/verse initial, constraints controlling sentential accent cause initial accent

(23) this analysis requires a formal change from Frazier (2006), which assumed binary dominance (affixes are either recessive or dominant)

   a. for Vedic only the vocative is dominant; assuming dominance is binary, all other endings are recessive

   b. consider the weak forms of 'foot' in (18), i.e. padí *loc sg*

   c. if the vocative ending requires the deletion of accent from all and any stem inflected with a recessive affix, this would put accent on the stem of padí (i.e. pádi) so that it could be deleted in the vocative

   d. problem is remedied of affixes can be neither dominant nor recessive, i.e. not bear the feature [± dominant]

   e. only the nom sg, i.e. the "basic form", is [-dominant], only the voc is [+dominant], and all other endings do not bear this feature

(24) final constraint ranking:

   a. ¬OP-MAX(ACCENT): realize a dominant ending by deleting accent from the stem (as compared to the same stem when inflected with a recessive ending)

   b. MAX(ACCENT)$_{root}$: do not delete underlying accent in a root

   c. MAX(ACCENT): do not delete underlying accent anywhere

   d. ALIGNR (accent, stem): accent occurs in stem-final position

(25) transition from PIE to Vedic

   a. morpheme reanalysis leads to fewer accent classes

     i. consider ***peh$_2$-ter-* > *pitar-* 'father'

     ii. ***peh$_2$-ter-* > **ph$_2$ter-* : dimorphemic (with post-accenting root) becomes monomorphemic (with unaccented root), regular sound laws yield *pitar-*

     iii. **ph$_2$ter-* is now an *amphikinetic root noun*

     iv. fusion of all post-accenting roots and unaccented suffixes leads to loss of hysterokinetic accent class

   b. preference for initial stress reanalyzed as preference for stem final stress

     i. many stems are monosyllabic on the surface, some due to syncopation of nonhigh vowels

     ii. initial stress = stem final stress (i.e. **péd-*, **ph$_2$ter-*, **nék^{w}t*)

   c. loss of dominance specification on nominative and accusative endings: only two accent patterns (columnar and alternating), dominance not necessary to derive patterns

   d. reanalysis of dominant vocative ending as requiring accent deletion (instead of accent insertion)

   e. demotion of MAX(ACCENT)$_{root}$ below ¬OP constraint

5. Conclusions

(26) implications for future work: testing hypotheses about underlying representations for PIE

   a. testing the system: if a root or suffix appears in an amphikinetic noun, it must be unaccented, and cannot appear in an acrostatic noun (in the case of the root) or a proterokinetic noun (in the case of the suffix)

   b. resolving ambiguity: if a root appears in a proterokinetic noun, we cannot determine if it is unaccented or post-accenting unless we find it in an amphikinetic (=unaccented) or hysterokinetic (=post-accenting) noun

(27) accent in athematic nouns is not theoretically suspect

   a. simple underlying representations yield predictable accent alternations using a constraint based system of phonology

   b. ease of transition from PIE to Vedic provides evidence for analysis
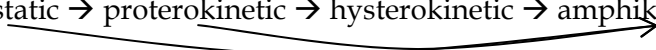
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Appendix : Implications for Internal Derivation

(1) internal derivation = deriving a different meaning from an athematic noun by changing its accent class (see Widmer 2004)

(2) possible paths of derivation:
acrostatic → proterokinetic → hysterokinetic → amphikinetic

- acrostatic and proterokinetic each have two possible paths of derivation and each have two possible stem URs

(3) each path of derivation can be explained by the deletion of an underlying accent or a post-accenting feature; no accent or post-accenting feature can be deleted from amphikinetic URs and no accent class is derived from amphikinetics)

accent class/UR	→	accent class/UR	deletion
acro/$\acute{R}\acute{S}$	→	protero/$R\acute{S}$	root accent
acro/$\acute{R}S$	→	amphi/RS	root accent
protero/$R\acute{S}$	→	amphi/RS	suffix accent
protero/$R_{pa}\acute{S}$	→	hystero/$R_{pa}S$	suffix accent
hystero/$R_{pa}S$	→	amphi/RS	post-accenting feature