

Lexical accents are underlying foot edges: New evidence from ancient Indo-European languages

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This paper is concerned with the lexical representation of accentedness — i.e., the property by which certain morphemes attract word-level stress in languages in which its surface distribution is not phonologically predictable. Recent constraint-based approaches to this question have generally assumed that a lexical accent is a prosodic element affiliated with an accented morpheme, but diverge in whether:

- (i) It is an abstract prominence autosegmentally linked to an input vowel, which is thus preferentially incorporated into metrical structure (Revithiadou 1999, 2007, Alderete 2001, *i.a.*).
- (ii) It is metrical structure directly pre-specified in the input (Inkelas 1999, Özçelik 2014, *i.a.*).

I argue that only (ii) can account for the distribution of word stress in two ancient Indo-European (IE) languages, Vedic Sanskrit (Indic) and Hittite (Anatolian). Both languages have a lexical contrast between accented and unaccented morphemes and a phonological preference for the single stress-bearing syllable to coincide with the word's left edge (Kiparsky and Halle 1977; Kiparsky 2010; Yates 2016, 2017), which can be seen (e.g.) in (1–3) (accent/stress marked with “˘”; Sanskrit forms are presented in IAST, Hittite forms in transcription/IPA):

- (1) a. Hitt. /pat-os/ → *pātu[š]* [pá:tos] ‘feet’ (foot-ANIM.ACC.PL) (⇒ default leftmost stress)
- b. Ved. /pad-am/ → *pádam* ‘foot’ (foot-ANIM.ACC.SG)
- (2) a. Hitt. /pat-án/ → *patán* [patá:n] ‘of the feet’ (foot-ANIM.GEN.PL) (⇒ accented attracts stress)
- b. Ved. /pad-á/ → *padá* ‘with the foot’ (foot-ANIM.INSTR.SG)
- (3) a. Hitt. /kénu-ás/ → *gēnuwaš* [ké:nwas] ‘of the knee’ (knee-N.GEN.SG) (⇒ leftmost accented wins)
- b. Ved. /gáv-á/ → *gávā* ‘with the cow’ (cow-ANIM.INSTR.SG)

The crucial pattern involves words with stem-final accent like (4–5). When followed by an unaccented inflectional endings, the stem-final syllable predictably attracts stress, as in (4); before accented inflectional endings, however, the accented stem-final vowel undergoes deletion and stress surfaces on the ending, as in (5a–b). (5c) shows that the accented ending attracts stress **only** if deletion occurs; when deletion is blocked — e.g., by phonotactics (*[.mn]) in (5c) — then the accented stem-final retains stress.

- (4) a. Hitt. /pisén-os/ → *pišēnuš* [pisé:n-os] ‘men’ (man-ANIM.ACC.PL)
- b. Ved. /ukṣán-as/ → *ukṣánas* ‘oxen’ (ox-ANIM.NOM.PL)
- c. Ved. /brah-māṇ-as/ → *brahmāṇas* ‘priests’ (priest-ANIM.NOM.PL)
- (5) a. Hitt. /pisén-ás/ → [*p*]išnāš [pisn-á:s] ‘of the man’ (man-ANIM.GEN.SG)
- b. Ved. /ukṣán-ás/ → *ukṣnás* ‘of the ox’ (ox-ANIM.GEN.SG)
- c. Ved. /brah-māṇ-ás/ → *brahmāṇas* ‘of the priest’ (priest-ANIM.GEN.SG)

The data in (5) is problematic under any analysis that adopts the representation of accentedness in (i). If it is assumed that vowel deletion is conditioned by surface stress on the following syllable (Yates 2017), it is difficult to explain why (e.g.) Hitt. [pisn-á:s] with deletion and stressed inflectional ending in (5a) should be preferred to a form like *[pisé:n-as] with non-deletion and stem-final stress, since both forms equally satisfy the preference for left edge stress (i.e., 1σ intervening). Alternatively, Kiparsky (2010) has proposed that deletion is morphologically conditioned by accented inflectional endings and that, when the accented vowel is deleted, its accent migrates rightward onto the inflectional ending (“secondary mobility”), where it is realized as stress. This hypothesis would account not only for (5), but also

for Vedic forms like (6b): when syllabification renders the accented high vowel non-syllabic, its accent similarly undergoes “secondary mobility” and is realized as stress on the **unaccented** inflectional ending to its right:


- (6) a. Ved. /ar-í-s/ → *arís* ‘friend’ (friend-ANIM.NOM.SG) b. /ar-í-as/ → *aryás* ‘friends’ (friend-ANIM.NOM.PL)

Yet this hypothesis fails to explain the direction of accentual migration: if deletion of its vocalic sponsor allows a lexical accent to float, it is unclear why it should migrate rightward rather than leftward, since the latter would better satisfy the preference for left-edge stress (Hitt. *[písnas], Ved. *úkṣnas, *áryas).


I show that these problematic patterns can be accounted for if metrical structure is pre-specified in the input (per (ii) above). Specifically, I propose that in Vedic and Hittite are trochaic languages in which accented morphemes contain the left edge of a foot in their lexical representation and in which a high-ranking faithfulness constraint — ANCHOR-L in (7a) — ensures that this foot edge is preserved in the output (cf. Özçelik 2014, Yawney 2018). This analysis accounts straightforwardly for (6b): when the suffix is resyllabified, the left foot edge remains in place and the following vowel is incorporated into the head of a trochaic foot — i.e., Ved. /ar-(i-as/ → *ar.(yás)*. It also correctly generates the forms in (5) above with stem-final vowel deletion and “secondary mobility.” Some relevant constraints are defined in (7); tableaux for (5b) and (5c) are provided in (8) and (9) respectively:

- (7) a. ANCHOR-L: The left edge of every foot in the input corresponds to the left edge of a foot in the output. Assign a violation (*) if a syllable intervenes. (ANCHOR-L)
 b. ALL-FEET-LEFT: Feet must be aligned with the left-edge of the prosodic word. Assign one violation (*) for each intervening syllable. (ALL-FEET-L)
 c. CULMINATIVITY: A prosodic word must have at least one prosodic peak (= stress). (CULM)
 d. SONORITY SEQUENCING PRINCIPLE: Sonority must increase between syllable margins and the nucleus. (SSP)

(8)

uk(ṣan-(as	SSP	CULM	ANCHOR-L	ALL-FEET-L	MAX-V
a. uk.(ṣá).(nás)		*!		***	
b. uk.(ṣá.nas)			*!	*	
c. uk.ṣa.(nás)			*!	**	
d.  uk.(ṣṇás)				*	*
e. (úk).ṣnas			*!*		*

(9)

brah-(maṇ-(as	SSP	CULM	ANCHOR-L	ALL-FEET-L	MAX-V
a. brah.(má).(ṇás)		*!		***	
b.  brah.(má.ṇas)			*	*	
c. brah.ma.(ṇás)			*	**!	
d. brah.(mnás)	*!			*	*

Crucially, in (8) deletion of the stem-final vowel allows a single foot in the output to correspond to a two distinct feet in the input; the winning candidate (d) with deletion thus satisfies ANCHOR-L, which is violated by candidates (b) and (c) in which the foot associated with the suffix or with the ending fails to correspond with an output foot, and twice by (e) in which neither corresponds. In the tableau (9), in contrast, candidate (d) with deletion is phonotactically illicit (by SSP); of the ANCHOR-violating candidates (b) and (c), (b) is preferred because it better satisfies the preference for left-edge stress.