

# Evidence for foot structure in Vedic

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# Accent in Sanskrit: The diachronic perspective

- The starting point: morphological accent in Early Vedic
- The end point: Metrical accent in Classical Sanskrit and in the Prākṛits
- But what's inbetween?
- Are the ingredients of classical accent already there in Vedic?

# Morphological accent

- at the core, Vedic accent was morphological.
- evidence: Internal derivation / accent shift as in *ápas-* ⇒ *apás-*, *bráhmaṇ-* ⇒ *brahmán-* etc. (for the mechanism see Keydana 2013)
- further evidence: paradigmatic accent

static

acc.sg.	<i>rāj-am</i> → ' <i>rājam</i>	head-dominance
gen.sg.	<i>rāj-às</i> → ' <i>rājas</i>	head-dominance

mobile

acc.sg.	<i>pād-am</i> → ' <i>pādam</i>	BAP
gen.sg.	<i>pād-às</i> → <i>pā'das</i>	recessive desinence

# Evidence for the breakdown

- accent doublets like *matí-*, *máti-* (loss of the lexical specification)
- accent patterns with (some) affixes, e.g. *-ya-*:
  - accent of the base (*áśvya-*, *śvetyá-*)
  - but: “Beibehaltung von Binnenbetonung unbeliebt [. . . ]; es tritt dafür am liebsten Svaritierung des *-ya-* ein” (Debrunner 1954: 815), cf. *ucat<sup>h</sup>yà-* etc.

# Metrical accent in Classical Sanskrit

3 patterns attested (Wackernagel 1896: 296)

- $\underline{\text{u}}\underline{\text{u}}\acute{\text{u}}\underline{\text{u}}$
- $\underline{\text{u}}\acute{\text{u}}\underline{\text{u}}\underline{\text{u}}$
- $\acute{\text{u}}\underline{\text{u}}\underline{\text{u}}\underline{\text{u}}$

observations:

- 1 feet are trochees,
- 2 if possible under restriction (1), stress is realized on a heavy syllable,
- 3 leftmost accent wins,
- 4 ideally the weight pattern follows the stress pattern.

## The grammar

against Hayes (1995: 297-8): no unbounded domain since “all languages employ all prosodic constituents in the prosodic hierarchy” (de Lacy 2007: 287)

constraints:

- FOOTBIN: Feet are binary, either  $\sigma\sigma$  or  $\mu\mu$ .
- WSP: Weight-to-Stress-Principle: Heavy syllables bear stress. (Prince 1990)
- ALIGN-L(Ft,PrWd): The left edge of a foot coincides with the left edge of the prosodic word.
- TROCHEE: Feet are trochaic.
- (no evidence for moraic feet and extrametrical final syllable, hence low NONFINAL)

ranking

FOOTBIN, WSP, TROCHEE  $\gg$  ALIGN-L(Ft,PrWd).

## The grammar at work

ॐ_ॐ	FOOTBIN	WSP	TROCHEE	ALIGN-L(Ft,PrWd)
ॐ [ॐ]ॐ		*		
[ॐ]ॐ		*	*	
ॐ[ॐ]		*		*

ॐ_ॐ	FOOTBIN	WSP	TROCHEE	ALIGN-L(Ft,PrWd)
ॐ [ॐ]ॐ				*
[ॐ_]ॐ		*		
ॐ_[ॐ]		*		*

ॐ_ॐ	FOOTBIN	WSP	TROCHEE	ALIGN-L(Ft,PrWd)
ॐ ॐ[ॐ]				*
[ॐ_]ॐ		*		



# Evidence in Vedic?

- What to look for?
  - rhythmic weight-patterns
  - preference for stressed long vowels (WSP)
- Where to look?
  - in patterns not determined by lexical specifications
  - best candidate: reduplication!
 

REDS are the perfect playing ground for language because of their underspecification and their lack of correspondence to lexical inputs.

    - for lengthened REDS in the perfect see Oldenberg (1906: 178): heavy RED with light root syllable, light RED with heavy root syllable (“Wetterhäuschenregel”, Krisch 1996: 52, but see de Vaan 2003: 78), Kümmel (2000: 22): functional factors (lengthening rare with past readings)

## The reduplicated aorist

(á)jī.ja.nat, (á)vī.vr.d<sup>h</sup>at, (á)vī.va.śat, (a)siṣ.ya.dat, (a)cik.ra.dat etc.

- RED heavy, accented / root light, unaccented,
- note: This is not about ablaut, cf. (a)dī.d<sup>h</sup>a.rat, bī.b<sup>h</sup>a.yat etc.
- in athematic forms only, cf. (á)nū.not, (á)su.ṣrot. But:  
(á)su.ṣot (MS., contour!)

### The pattern:

Syllabic trochee with heavy stressed syllable (see already Macdonell 1910: 374, Cooper 2014: 42)

# The desiderative

- data: *jí-jñā-ṣa-*, *ní-nī-ṣa-*, *dí-dṛk-ṣa-*, *jí-jyā-ṣa-*, *rú-rukṣa-* etc.
  - RED always bears stress.
  - vowel in RED is *i* (or *u*).
  - root “generally remains unchanged” (Macdonell 1910: 388)
  - result:  $\acute{\_}$  (or  $\underset{\cdot}{\_}$ ? but then you can't shorten a short vowel!)
- more data: *ci-kī-ṣa-*, *ji-gī-ṣa-*, *śú-śrū-ṣa-*, *ji-g<sup>h</sup>āṃ-ṣa-*
  - rhythmic pattern induces root vowel lengthening (*i, u, a* before N)
- $\bar{a} \rightarrow \bar{i}$  (once *i*): *pi-pī-ṣa-* / *pi-pā-ṣa-* (, *di-d<sup>h</sup>i-ṣa-*)
- (syncopation: *di-t-ṣa-* / *di-dā-ṣa-*, *d<sup>h</sup>i-t-ṣa-* / *di-d<sup>h</sup>i-ṣa-*)

## Whence the strange pattern?

- Roots in O or CC before *-sa-* necessarily surface as heavy syllables: *rú.ruk.ṣa-*, *bí.b<sup>h</sup>it.sa-* etc.
- If contour is the target, RED, though being accented, must be light (if possible)!
- But: the tendency to realize stress on heavy syllables leads to long vowel REDS:
  - *mī-māṃ-sa-* (AV), *tū-tur-ṣa-*, *bī-b<sup>h</sup>at-sa-*

### Conflicting interests

Contour counterbalanced by the WSP!

## The intensive: type *a* and *b*

- type *a*: RED bears stress, shows guṇa
  - 1.sg. *ne-nej-mi*, 3.pl. *ne-nij-ati* etc., stem  $\_ \cup / \_ \_$
  - *po-pruṭ<sup>h</sup>*- with superheavy 1<sup>st</sup> syllable. So why guṇa? ALIGN(RED, r /  $\sigma$ , r)?
  - note: secondary guṇa in forms like *vevid<sup>h</sup>yate* (:vya<sup>d<sup>h</sup></sup>-), *soṣupyate* (:svap-) (Wackernagel 1896: 62). Points to the WSP since *vya*- etc. are light
- type *b*: root with O in coda (Schaefer 1994: 25),  $\bar{a}$  in stressed RED:
  - *bā-bad<sup>h</sup>*-, *pā-pat*-, stem  $\_ \cup / \_ \_$
  - *śā-śras*- with superheavy 1<sup>st</sup> syllable. So why  $\bar{a}$ ? ALIGN(RED, r /  $\sigma$ , r) again?

types *a* and *b* point to a template  $C\acute{\mu}\mu$  (or  $\acute{\omega}$ )

WSP? Probably!

Rhythmic patterns? No!

## The intensive: type c

- type c: root with R in coda, guṇa in stressed RED
  - *dar-dr-*, *jan̄g<sup>h</sup>an-* etc.
  - stem  $\acute{u}u / \acute{u}u$ .
  - alignment follows from SONSEQ.
  - template again C $\acute{u}u$  (or  $\acute{u}u$ ).

type c = type a.

Corollary for syllable structure: Is this evidence for R-diphthongs?

## The intensive: type *d*

- type *d*: stressed guṇa +  $\check{i}$  in RED: RED always  $\acute{\cup}$   $\underline{\cup}$ 
  - *ganī-gam-* / *gani-gm-* (besides *jañ-gam-* Br.).
  - template  $C\acute{\mu}C\mu\mu$
  - no ALIGN(RED, r /  $\sigma$ , r)

type *d* is built on type *c*.

Additional requirements: NOCODA and heavy syllable ( $\mu\mu$  or  $\underline{\cup}$ ) adjacent to the root.

# Sheer phonological exuberance (Jamison 1988: 218)?

- Why the restriction of type *d* to roots in sonorants? Because *d* is a repair for *c*:
  - in *c* the sonorant necessarily ends up in coda position,
  - which is avoided if possible, see Keydana (2008).
  - And avoidance is indeed possible here because the reduplicant does not stand in any faithfulness-relation to the input.
- Why then length? Bimoraicity (which comes for free with roots with complex onsets) is attractive since it results in contour.
- But why is lengthening in type *d* possible? Because *i* is epenthetic. Thus, there is no DEPIO-violation!



# Commonalities

- stressed first syllable (incipient trochee!)
- rhythmic weight pattern (2 syllables only) at the left margin of the word
  - reduplicated aorist: syllabic trochee
  - desiderative: syllabic iamb; forced by (1) thrive for contour, (2) heavy root syllable
  - intensive: syllabic iamb in type *d*, induced by phonological repair
- WSP-tendencies
  - reduplicated aorist: accented RED heavy
  - desiderative: tendency to lengthen RED
  - intensive: heavy RED in types *a*, *b*, *c* (the latter long by position)

## Further evidence for rhythmic patterns

- exhaustive parsing already in PIE (Keydana 2014)
- avoidance of sequences of 2 heavy syllables (Kulikov 2005)
- long vowel perfect reduplication and “Wetterhäuschenregel”, see above
- “Flipping of reduplication and root vowels is then possible, to accomodate metrical circumstances” (Jamison 1988: 217)
- rhythmic distribution of suffixes<sup>?</sup>, e.g. *-āna-* / *-māna-*
  - *vr̥dʰānā-* (Meillet 1920: 197), *yātāna-* (Renou 1925: 137)
  - Meillet (1920: 197): “des innovations analogiques [...] qui amènent le rythme trochaïque.” But see Lowe (2015: 246-7).

## Summary: Rhythm and metrical accent

- Vedic had all the ingredients needed for the development of metrical accent à la Classical Sanskrit:
  - thrive for contour, at least partly trochaic, manifest most clearly at the left word-edge,
  - the BAP, which lends itself to a reanalysis as left-aligned syllabic trochee,
  - a strong WSP-tendency.
- When lexical specifications were lost (a process which already started in Early Vedic), everything else fell in place!

# Reduplication in Avestan

- Length alternations in the perfect reduplication: No evidence for rhythmic patterns, see de Vaan (2003: 79ff.)
- Desideratives pattern *grosso modo* with Vedic.
- Intensives without type *d*.
- But:  $\bar{i}$  in light RED-syllables (mostly OAv., de Vaan 2003: 210,220).
  - The data point to a further constraint: Lengthening only if the following syllable is light – in other words, contour (cf. de Vaan 2003: 221)
  - cf. *jīgərəzat̄*, *jījīšəntī*, *hīšasaṭ̄* (metrically *hišsaṭ!*), *dīdaṛjhē* (nasalized vowel? de Vaan 2013, Keyser and Stevens 2006) as opposed to *didās*, *cikōitərəš*
  - no lengthening in closed syllables, cf. *cixšnuša-* etc. (de Vaan 2003: 212)

# One last thing...

Why do rhythm and the WSP become so productive in Indo-Aryan?  
Substratum? Munda-influence? Santali, Mundari, Sora have both trochees and the WSP (van der Hulst and Schiering 2010: 576)!

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