

Compositional vs. Paradigmatic Approaches to Accent and Ablaut*

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1 IE word accentuation

COMPOSITIONAL approaches to mobile accentuation of the Indo-European type derive the accent of words from the lexically specified accentual features of their constituent morphemes, together with the BASIC ACCENTUATION PRINCIPLE (BAP), which erases all accents but the leftmost one, and assigns an accent to the left edge of an unaccented domain.¹ I propose here a compositional analysis in which BAP is a phrase-level process and stems default to the right by the OXYTONE RULE. I argue that zero grade ablaut is sensitive to the accents erased by the BAP, and therefore applies before it. In agreement with most compositional analyses, I distinguish between DOMINANT and RECESSIVE derivational suffixes.² COMPOSITIONAL approaches to mobile accentuation of the Indo-European type derive the accent of words from the lexically specified accentual features of their constituent morphemes, together with the BASIC ACCENTUATION PRINCIPLE (BAP), which erases all accents but the leftmost one, and assigns an accent to the left edge of an unaccented domain.³ I propose here a compositional analysis in which BAP is a phrase-level process and stems default to the right by the OXYTONE RULE. I argue that zero grade ablaut is sensitive to the accents erased by the BAP, and therefore applies before it. In agreement

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¹This type of analysis has been proposed for Sanskrit (Kiparsky 1984), Greek (Kiparsky 1967, 2003, Steriade 1988, Sauzet 1989, and Golston 1990, see Probert 2006, 4.7 for a review) and comparative Balto-Slavic (Garde 1976, 2006, Halle & Kiparsky 1979, 1981, Dybo 1981, 2000, Halle 2001); also for the mobile accent systems of modern Greek (Revithiadou 1999), Russian (Halle 1973, Halle & Kiparsky 1979, Melvold 1990), and Lithuanian (Blevins 1993). Comparative Indo-European work based on the compositional approach includes Kiparsky 1973, Garde 1976, Kiparsky and Halle 1977, Halle 1997, Lubotsky 1988, Hock 1993, Kim 2002, Frazier 2007, and Marston 2009; see Clackson 2007: 84-86.

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with most compositional analyses, I distinguish between DOMINANT and RECESSIVE derivational suffixes.⁴

I compare this account to Schindler’s (1972, 1975a, 1975b) PARADIGMATIC analysis, which groups athematic primary nominal formations into four accent types, ACROSTATIC, HYSTEROKINETIC, AMPHIKINETIC, and PROTEROKINETIC,⁵ schematized in (1) for words with three monosyllabic morphemes (Root - Suffix - Desinence).⁶

(1)		<i>acrostatic</i>			<i>hysterokinetic</i>			<i>amphikinetic</i>			<i>proterokinetic</i>		
	<i>strong cases</i>	ó	∅	∅	∅	é	∅	é	o	∅	é	∅	∅
	<i>weak cases</i>	é	∅	∅	∅	∅	é	∅	∅	é	∅	é	∅

∅ stands for a morpheme with zero grade. The suffix may be morphologically null at least in the acrostatic type.⁷ This is currently the most widely accepted account of Proto-Indo-European inflectional accent and ablaut.

The compositional and paradigmatic approaches differ not only in empirical coverage and analytic technique, but in their goals and theoretical orientation. In part, the difference reflects the “constant tension between scholars who seek to reconstruct the ‘last stage of IE’ and those who wish to find the underlying, and chronologically earlier, basis for that reconstruction” (Clackson 2007: 87). Many Indo-Europeanists probably like the paradigmatic approach because it organizes the hypothetical patterns perspicuously and concretely, cleanly separating empirical description and historical reconstruction from issues of explanation and typological plausibility. But by the same token one may object to the way it allows types to be set up ad libitum without any guiding principle. Here are some reasons why even comparativists who are happily agnostic about linguistic theory might benefit from the compositional approach’s greater degree of analytic commitment.

1. Rules and exceptions. In order to identify potential analogical innovations, the comparative method needs a reliable way of distinguishing between rules and exceptions. This is not easy to do for the complex networks of criss-crossing and hierarchically related regularities that govern accent and ablaut. For example, the Acc.Pl. ending **-ms* induces root accent in Greek and suffix accent in Sanskrit. Which is original, and which is the analogical innovation? It takes some delving into the system to find an answer (see below for mine). Thus articulating the grammar in a principled way, as the compositional analysis does, puts the reconstruction on a more solid footing.

⁴I will have no need for the features PREACCENTING and POSTACCENTING. In derivational morphology there are also initial-accenting suffixes, not treated in this article.

⁵Building on Pedersen 1926, Kuiper 1942, and Rix 1965; see also Eichner 1973, 1974. Meier-Brügger 2002: 205 ff. and Clackson 2007 provide summaries; Szemerényi 1996, Ch. 8 and Sihler 1995: 314-15 and *passim* remain sceptical. An additional MESOSTATIC type with fixed accent on the Suffix and no ablaut alternations is well supported; other scholars have proposed to add the more controversial TELEUTOSTATIC, ACROKINETIC (RHIZOKINETIC), and ANAKINETIC types (notably Tremblay 2003). It is moreover usual to distinguish at least two subtypes of acrostatic stems, one with *ó ~ é* ablaut as in (1), the other, attributed to Hoffmann, with *ē ~ é* ablaut (Widmer 2004: 50, Schaffner 2001: 76 ff.). Many more subtypes are introduced in Beekes 1995.

⁶The “strong” cases (*cas forts*) are the Nominative and Accusative, except that the Accusative Plural is “weak”; see below for why this might be so. The locative singular is a type apart, with a zero ending before which the suffixes in the acrostatic, hysterokinetic, and amphikinetic types have accented *-é-*.

⁷There is no generally agreed on way to accommodate mobile root nouns in this typology. Some scholars include them in the amphikinetic type, others consider them a variant of the hysterokinetic type, and yet others treat them as a separate type altogether. In section 2.2 I argue that this is not an empirical matter but a purely terminological one, an artifact of the paradigmatic approach which does not arise in the compositional approach.

2. *Comprehensiveness*. Because of the generality of the accentual features and combinatoric principles, a compositional analysis *necessarily* extends to the whole morphology. It does not allow an encapsulated account of inflectional accentuation, still less of athematic nouns. In sections 4 and 5 I argue that this is a virtue of the compositional approach, that the analysis developed for inflection generalizes to internal and external derivation,⁸ and that the BAP explains the main generalizations about the accentuation of compounds. For the same reason, a compositional analysis is intrinsically well-defined for, and automatically extends to, words with more than one Suffix, unlike (1), which must be fleshed out in some fashion to cover them.⁹ In general, the more comprehensive the analysis becomes, the more the advantages of the compositional approach stand out.

3. *Descriptive accuracy*. While the paradigmatic approach operates with the sole audible accent of a word (the ICTUS), and attributes zero grade ablaut to deletion of unaccented vowels, the compositional approach countenances underlying representations with more than one accented morpheme, or none. The rule I propose for zero grade, that an ablauting vowel is lost when the following syllable is lexically accented, regardless of whether the deleted vowel is itself accented or not, and regardless of where the ictus of the word lies, can be formulated *only* within a compositional approach.

4. *Naturalness*. More objectionable than the massive analogical restructuring required to get from the hypothesized system in (1) to that of the attested languages, or even to the reconstructed Indo-European paradigms that the normal comparative method yields, is the typological implausibility of the reconstruction, some whose aspects are even unparalleled in any actual language. Where else do proterokinetic accent paradigms exist? What languages have vowel deletion patterns like (1)? The compositional theory's accent and dominance features, and the zero grade rule formulated here, certainly have good parallels.¹⁰

5. *Generality*. The compositional approach brings out some salient generalizations about IE accentual alternations that lie hidden in the paradigmatic approach's lists of types and correspondences between types. The two most important of these generalizations are: that all accentual

⁸A bonus of not singling out inflection for special treatment is that we don't have to worry about delimiting it from derivation: should such categories as tense/aspect, gender, participles, infinitives, or the collective plural be classed as derivational, inflectional, or perhaps something in between? For the compositional account it does not matter, at least in so far as the accentual feature values are not aligned with derivation vs. inflection.

⁹Specifically, the compositional analysis developed here predicts that the accent of a stem is determined by its last dominant suffix; if it has no dominant suffixes, then by its first inherently accented suffix, and if it has no accented suffixes either, then by the Oxytone Rule of section 2.2. To be clear, I am *not* saying that a paradigmatic analysis cannot deal with derivational accentuation; rather, I am saying that it does not make any intrinsic predictions about it and does not relate it theoretically to inflectional accentuation. A similar issue is how to include root nouns with movable accent in the typology. Are they amphikinetic, hysterokinetic, or proterokinetic, or do they perhaps constitute a class of their own? I take up nouns of this type in section 2.2 and show that the difficulty of accommodating them neatly in the four-class inventory is intrinsic to the paradigmatic approach. The compositional approach needs to say nothing more than that these nouns have no Suffix (or that they have a null Suffix, which amounts to the same thing). The rest follows from the general rules of accent and ablaut.

¹⁰For syncope, see Griffen 1996. Typological parallels for the morpheme features DOMINANT/RECESSIVE and ACCENTED/UNACCENTED analysis exist in Japanese (McCawley 1968, Poser 1985), Hebrew (Mel'čuk & Podolsky 1996), Asurini (Harrison 1971) and Cupeño (Hill & Hill 1968, Alderete 1999), and Abkhaz (Dybo 1977, 2000, Ch. 5, Trigo 1992). Salish morphemes are also either ACCENTED or UNACCENTED (Czaykowska-Higgins 1993, Shaw et. al. 1999, Coelho 2002, Idsardi 1991 for Interior Salish, Bar-el & Watt 1998 for Skwxwú7mesh). The BAP has an analog in Salish, where "in words with no accented morphemes, stress falls close to the left edge of the prosodic word; ... in words with accented morphemes, stress falls on the rightmost accented morpheme" (Coelho 2002). Cupeño (Uto-Aztecan) has a very Indo-European-like system with accented, unaccented, and preaccenting suffixes, with dominant root accent and left edge default (Hill & Hill 1968).

mobility within inflectional paradigms involves rightward shift in the weak cases (section 2), and that all internal derivation between inflectional paradigms involves accent deletion (section 4). If these generalizations did not hold — for example, if an anakinetic type (reverse mobility), or the fifth type of internal derivation discussed in section 4.1, really existed — a paradigmatic analysis would simply add the additional types to its inventory, whereas the compositional analysis would be undermined.

6. *Theoretical grounding.* The compositional approach fits hand in glove with morphophonological theory. The formal properties of dominance have been widely studied in stress and harmony systems. More generally, lexical prespecification of prosodic and non-prosodic features has been argued for by Inkelas (1998 and subsequent work). Because of its wide applicability, the compositional approach has by now an extensive theory behind it, which can inform reconstruction, buttressing its results and potentially explaining them.

A more empirical comparison of the two approaches is hampered by the fact that they address partly complementary data. The compositional style of analysis generally fits the attested Indo-European languages well, but has trouble accommodating some features of the proposed proto-Indo-European paradigms in (1). On the other hand, the paradigmatic approach (as it has been articulated in IE work) is ill suited for actually existing accent systems such as that of Sanskrit and Russian, because it does not provide a mechanism for dealing with their many ramified accentual subtypes and with the subregularities that govern them, and because its surface-oriented character leaves no room for factoring out morphophonological processes from the morphological patterns.

The formal implementation of the compositional approach raises many issues. One has to do with derivational vs. non-derivational (OT) treatments. Do dominant morphemes trigger an accent deletion rule, or are they subject to (Anti-)Faithfulness constraints, as argued by Alderete 1999 (for Indo-European see Kim 2002 and Frazier 2007)? Another is about the nature of phonological representations: how are accented morphemes lexically marked as prominent — by stress, pitch, lexical footing, grid marks, or some more abstract prominence property? These questions go beyond the treatment of IE mobile accent and have to be resolved in a wider theoretical context. For purposes of this article I assume a simple derivational model, with cyclically interleaved morphology and morphophonology à la Lexical Phonology. I think a reformulation in (Stratal) OT terms would improve the analysis, but it would take too much space to present (first steps in Marston 2009).

2 Inflectional accent and ablaut

2.1 The compositional approach

The three major inflectional accent patterns of Vedic are shown in (2) with examples that also illustrate some of their major subtypes.

(2) Vedic noun inflection

1. Fixed, barytone and oxytone (\approx acrostatic and mesostatic)

	Strong	Weak V-	Weak C- ('Middle')
NPl.	<i>gáv-as</i>	DSg. <i>gáv-e</i>	IPl. <i>gó-bhis</i> 'cow'
AccSg.	<i>tri-vít-am</i>	DSg. <i>tri-vít-as</i>	IPl. <i>tri-vít-bhis</i> 'threefold'
AccSg.	<i>kakúbh-am</i>	AccPl. <i>kakúbh-as</i>	LPl. <i>kakúp-su</i> 'peak'

AccSg.	<i>bhrátar-am</i>	Isg.	<i>bhrátr-ā</i>	LPl.	<i>bhrátr-ṣu</i>	‘brother’
AccSg.	<i>dhāma</i>	Isg.	<i>dhāmn-ā</i>	LPl.	<i>dhāma-su</i>	‘abode’ (n.)
3Sg.	<i>tāṣ-ṭi</i>	3Pl.	<i>tākṣa-ti</i>			‘to fashion’

2. Predesinential/desinential mobility (\approx hysterokinetic)

a. Accent on Weak and Middle endings

NPl.	<i>nāv-as</i>	GSg.	<i>nāv-ás</i>	IPl.	<i>nau-bhís</i>	‘boat’
AccPl.	<i>mās-as</i>	ISg.	<i>mās-á</i>	IPl.	<i>mād-bhís</i>	‘month’
AccSg.	<i>vṛt-am</i>	ISg.	<i>vṛt-á</i>	LPl.	<i>vṛt-sú</i>	‘turning’
3Sg.	<i>é-ti</i>	3Pl.	<i>y-ánti</i>			‘to go’

a. Accent on Weak endings, stem-final before Middle endings

AccSg.	<i>pitár-am</i>	Isg.	<i>pitr-á</i>	LPl.	<i>pitṛ-ṣu</i>	‘father’
AccSg.	<i>bhūmán-am</i>	Isg.	<i>bhūmn-á</i>	LPl.	<i>bhūmá-su</i>	‘abundance’

3. Initial/desinential mobility (\approx amphikinetic)

AccSg.	<i>púmāms-am</i>	GPl.	<i>pums-ám</i>	LPl.	<i>puṃ-sú</i>	‘male’
AccSg.	<i>pánthān-am</i>	GPl.	<i>path-ám</i>	LPl.	<i>pathí-ṣu</i>	‘path’

In the movable paradigms, the strong case desinences (*cas fortes*) are unaccented and induce an accent on their stem, and the weak case desinences (*cas faibles*) are accented. “Middle” case endings are just weak endings that begin with a consonant; their effect on syllable structure suffices to account for their special behavior in movable paradigms, as we’ll see. All inflectional endings preserve the accent of their stem (that is, they are recessive).

In this analysis, the distinctive property of “preaccenting” suffixes is that they are unaccented. Although suffix accent is unpredictable, some partial generalizations can be formulated, especially for inflectional endings. The unaccented endings include all nonsyllabic ones, obviously, such as Nom. Sg. *-s* and the singular active person endings *-m*, *-s*, *-t*, but also most suffixes that end in relatively low-sonority nuclei. This distribution is obscured by sound changes in Vedic, but restoring the IE forms of the endings makes it clearer. Unaccented are the syllabic forms of Acc.Sg. *-m*, Nom./Acc. Dual *-h₁*, Neuter Nom./Acc.Pl. (collective) *-h₂*, Loc.Sg. *-i*, singular active *-mi*, *-si*, *-ti* — vocalized sonorants and laryngeals, and high vowels.¹¹ Certainly, the correlation is not complete. Loc.Pl. *-sú* (if it was indeed accented) is an exception in one direction, and the unaccented, non-ablauting Nom.Pl. *-es* is an exception in the other direction.

This makes sense of the fact that Acc.Pl. **-ms* is accented, even though it evidently is a combination of two unaccented (and hence pre-accenting) desinences, Accusative *-m* and Plural *-s*. By the generalization just stated, *-ṃ* can’t be accented when it ends a word, but it can be accented when it is followed by something else.

- (3) a. Acc.Sg. **pód-ṃ* (> Skt. *pādam*)

¹¹Non-suffixal syllabic sonorants, however, were accentable even word-finally, e.g. **-ṃ* in *saptá*, *ἑπτά*, Gothic *sibun*.

b. Acc.Pl. **pod-m̄-s* (> Skt. *padāḥ*)

The accent of Greek Acc.Pl. (πόδας) is the result of analogy to all other Nominative and Accusative endings, consequent on the reanalysis as monomorphemic /-as/.

The distribution of mobility shows a clear pattern. (1) Non-ablauting polysyllabic stems are rigidly immobile: Instr.Sg. *yudh-ā* ‘fighting’ vs. *yavī-yúdh-ā* ‘fighting hard’ and *puro-yúdh-ā* ‘fighting in front’, *bhū-bhīs* ‘worlds’ vs. *ā-bhū-bhis* ‘present ones’, etc. (2) Ablauting polysyllabic stems are mobile, but have desinential accent only in those weak cases that begin with a vowel. (3) Monosyllabic mobile stems have desinential accent in all weak cases. (There are also immobile (acrostatic) monosyllabic stems, such as *gāuḥ* ‘cow’, which are inherently accented.) These generalizations hold also for Greek (ὀδόντ-ος vs. ὄντ-ός, δελφῖν-ος vs. ῥιν-ός, ὄφρῦ-σι vs. συ-σί, πατράσι vs. φρασί, ποιμένος vs. πατρός), and, we may fairly suppose, for late Proto-Indo-European.¹²

2.2 Accent mobility and ablaut

So why are polysyllabic non-ablauting stems immobile? Why do barytone (“acrostatic”) stems show the same ablaut as oxytone (“hysterokinetic”) stems in the daughter languages? And what causes their reduced mobility, specifically the stem-final accent in the middle cases? The answers are almost in hand.

In addition to the marking of lexical accent, the analysis posits two rules. The first is common ground to almost all compositional analyses.

- (4) BASIC ACCENTUATION PRINCIPLE (BAP): erase all accents but the leftmost one, and put an accent on the leftmost syllable of an unaccented domain.

The second workhorse of inflectional accentuation, not previously proposed for Indo-European, is the Oxytone Rule. It assigns an accent to the final accentable syllable of polysyllabic inflectional stems. Rather than restricting the rule mechanically to polysyllabic stems, let us take the term “root noun” seriously. Suppose that the distinction is — or at least originally was — not a matter of syllable count, but of morphological category: mobile root nouns like *yudh-*, *bhū-*, *dhī-* are, in fact, roots, while their immobile morphological derivatives, such as *yavī-yúdh-*, *pari-bhū-*, *ā-dhī-*, are stems. The Oxytone Rule is applicable to stems, but not to roots. (It is generally assumed in Lexical Phonology that roots are not phonological domains; the stem is the smallest unit subjected to phonology.)¹³

- (5) OXYTONE RULE: accent the rightmost syllable of an inflectional stem.¹⁴

The following derivation shows how the Oxytone Rule and the BAP together derive the accentuation of unaccented root nouns and derived stems in Sanskrit.¹⁵

¹²The mobility of the Balto-Slavic cognates (e.g. Instr.Pl. *dukterimīs* ‘daughters’) is uncontroversially an innovation, subsumed under Illich-Svitych’s Law, the much more general change to “true” mobility that affected *all* its oxytone stems (Illich-Svitych 1963 [1979], Kiparsky 1973), section 2.5 below.

¹³This recalls Melvold’s 1990 generalization that Russian unaccented nouns — nouns whose accent shifts between the initial and final syllable — are never morphologically derived (synchronically, of course). She derived this generalization from the cyclic application of the BAP.

¹⁴This rule does not have to be restricted to unaccented stems, because any inherent accents marked on earlier syllables will supersede them by the BAP. What is more, it can’t be so restricted, since the hidden accents it introduces function as regular triggers of zero grade ablaut.

¹⁵The dash — in a derivation indicates that no change takes place at that step, either because the rule is inapplicable, or because it takes effect vacuously.

(6)	vṛt-	vṛt-	tri-vṛt-	tri-vṛt-
Inflection	vṛt-am	vṛt-á	tri-vṛt-am	tri-vṛt-á
Oxytone	—	—	tri-vṛt-am	tri-vṛt-á
BAP	vṛt-am	—	—	tri-vṛt-ā
(Sanskrit)	vṛtam	vṛtā	trivṛtam	trivṛtā

The compositional analysis treats the relation between accent and ablaut in a novel way. As is clear from (2), zero grade bears no simple relationship to ictus. A word can have invariant accented zero grade (e.g. **jug-*, Skt. *sayúj-* ‘united’, Latin *coniux* ‘spouse’, σύζυξ ‘married’), or invariant unaccented full grade (**pleth₂-mon-*, Skt. *prathimán-* ‘width’, πλαταμών ‘surface’). Certainly root nouns could have underlying fixed zero grade vocalism as well as full grade; the former being favored except with *Ceh-* and *CehC-* roots, e.g. *-dā-*, *-mā-*, *sās-*, *bhrāj-*. Zero grade appears even in petrified strong cases: λίπα ‘oil(y)’, νίφα ‘snow’, Skt. Inf. *pra-tír-am* ‘to go forward’, Latin *vic-em* ‘in place of’. There are deep connections between accent and ablaut, but they are not transparent, even in the proto-language.

The connection between accent and ablaut can be seen most transparently in monosyllabic ablauting stems; one noun for which this pattern can be securely reconstructed for the proto-language is **kerd-* ‘heart’ (Vedic Nom.Sg. *(su)-hárt*, Dat.Sg. *hṛd-é*, Gen./Abl.Sg. *hṛd-áh*, Loc.Sg. *hṛd-í*, Instr.Pl. *hṛd-bhíh*, Loc.Pl. *hṛt-sú*, Gk. χῆρ, Lat. *cor, cordis*).¹⁶

(7)	k̂erd-∅	k̂erd-éi
∅ grade	—	k̂rd-éi
BAP	k̂érd	—
(Sanskrit)	<i>-hárt</i>	<i>hṛdé</i>

It is not clear how such mobile root nouns are to be accommodated in the four-type schema (1). Sometimes they just remain unnamed. Clackson (2007: 80) adds a separate category “kinetic” for them. Beekes (1995: 190) classifies them as hysterokinetic (hysterodynamic). Fortson (2005: 109) also considers this classification, with the remark that “the fit is not exact”. Meier-Brügger (2002: 219-220) categorically states that they are amphikinetic (amphidynamic). From our standpoint, there is no substantive issue at stake here. It is a pointless question of nomenclature internal to the paradigmatic approach, which by relying on templates rather than generative processes or constraints conflates morphology and morphophonology. Morphology has to do with the units out of which words are put together (for example, whether there is a suffix between the root and the desinence), while morphophonology cuts across different morphological configurations to account for the place of the accent, and for the application of ablaut (even these two being wrongly conflated in paradigmatic analyses, as we shall see). Folding the outcomes of all these independent processes together into the four types in (1) yields static templates which don’t generalize from one case to the next. So, for each morphological configuration that diverges from the tripartite Root — Suffix — Desinence template in (1), it is necessary to make a largely arbitrary decision about which type, if any, it should be fitted into. In contrast, separating word-formation and inflection from accent and ablaut rules and constraints, as the compositional approach does, integrates each morphological configuration into the system, and makes intrinsic predictions about the accent and ablaut of a word regardless of how morphemes it happens to have. If a compositional analysis

¹⁶The long vowel in the Nom./Acc.Sg. is assumed to be the result of compensatory lengthening, perhaps via assimilation **kerd* > **kerr* > **kēr* (Szemerényi’s Law). In Greek the noun has been reanalyzed as contracted and as a result has lost its accentual mobility.

doesn't generalize correctly from tripartite structures like those in (1) to binary and larger ones, it is empirically refuted, and if no compositional analysis does so, then the approach itself is refuted. And for the same reason, if a compositional analysis does generalize correctly to any morphological combination, it, and the theory behind it, can claim to have a genuine explanation of the data.

Stems of more than one syllable have exactly the same ablaut patterns whether they are barytone or oxytone: *bhrátar-am*, *bhrátr-ā* 'brother' is like *pitár-am*, *pitr-ā* 'father'. I conclude from this that zero grade is conditioned not by the ictus, the single audible accent of the word, but by the invariant underlying accents of its component morphemes. Accordingly, I posit rule (8) for Indo-European, and (appropriately modified for vocalism) also for Sanskrit.

(8) *Zero grade*

$e, o \rightarrow \emptyset$ before an accented morpheme.

The rule applies both to accented and unaccented syllables, provided an accented morpheme follows, no matter where the ictus falls in the word. It can take effect even across a syllable as long as it does not contain a non-high vowel ($*e, *a, *o$, Sanskrit *a*), e.g. Sanskrit Instr.Sg. /sánu-ná/ → (8),(10b) *snú-nā* → (BAP) *snú-nā* 'summit', but /prathi-man-ā/ → *prathi(m)nā* (not $*pr̥thi(m)nā$).

Note that I am not claiming that this is the only process responsible for zero grade ablaut. There is also a Syncope process which applies to a syllable that follows the ictus. For example, in the Vedic 3.Pl. root aorist of *kar* 'make', the active is /kar-ánt/ → *krán*, /á-kar-ánt/ → *ákran*, the middle is /kar-ánta/ → *kránta*, /á-kar-ánta/ → (8) *ákránta* → (Syncope) *ákrata*. The derivation of the latter form shows that Syncope applies to the output of (8), and therefore must be a distinct rule. Syncope also causes reduction in cases like (neuter) /bráh-man/ → *bráhma* 'prayer' (IE /bhlégh-men-/ → $*bhlégh-m̥$); it applies at the stem level in /táks-ant/ → *táks-at* 'fashioning' (/tetk-ent-/ → $*tetk̥nt-$), cf. Acc.Sg. *táks-at-am*.

The derivation of the polysyllabic ablauting pattern is shown in (9). By (8), zero grade applies pretonically, in the so-called Weak and Middle cases, and when this causes desyllabification, in the Weak cases, the result is mobility.

(9)	ph ₂ ter	ph ₂ ter	ph ₂ ter	bhráh ₂ ter	bhráh ₂ ter	bhráh ₂ ter
Inflection	ph ₂ ter-m̥	ph ₂ ter-éh ₁	ph ₂ ter-sú	bhráh ₂ ter-m̥	bhráh ₂ ter-éh ₁	bhráh ₂ ter-sú
Oxytone	ph ₂ tér-m̥	ph ₂ tér-éh ₁	ph ₂ tér-sú	bhráh ₂ tér-m̥	bhráh ₂ tér-éh ₁	bhráh ₂ tér-sú
∅ grade	—	ph ₂ tr-éh ₁	ph ₂ t̥-sú	—	bhráh ₂ tr-éh ₁	bhráh ₂ t̥-sú
BAP	—	—	ph ₂ t̥-su	bhráh ₂ ter-m̥	bhráh ₂ tr-eh ₁	bhráh ₂ tr-su
(Sanskrit)	<i>pitár-am</i>	<i>pitr-ā</i>	<i>pit̥-ṣu</i>	<i>bhrátar-am</i>	<i>bhrátr-ā</i>	<i>bhrátr̥-ṣu</i>

We see in (9) the two-way interaction of ablaut and accent in ablauting stems. Each conditions the other. The analysis explains why oxytones like *pitár* have the same vowel alternations as barytones like *svásar-*, *bhrátar-*. To translate the analysis into the paradigmatic terminology, we could say that the oxytone *pitár-* is fundamentally mesostatic as far as accent ins concerned, and its "hysterokinetic" behavior is a side effect of ablaut. In other words, (7) and (9) are two different types of accentual mobility. Root nouns are truly mobile at a deeper level of phonological

representation, polysyllables become mobile when their accented syllable is lost; we'll call this SECONDARY MOBILITY.¹⁷

- (10) a. *Primary mobility* (e.g. (7)). An unaccented stem is accented by the BAP before unaccented desinences (that is, in the weak cases). If the desinence is accented, the BAP is inapplicable.
- b. *Secondary mobility* (e.g. (9)). When a syllable is eliminated, its accent shifts to the next syllable.

The derivations in (9) would be consistent with an alternative analysis where the accent on a desyllabified vowel is simply deleted, rather than being transferred to the next syllable. Decisive evidence against this alternative comes from cases like Nom.Pl. /arí-as/ > *ary-ás*. Nom.Pl. -as (< *-es) is unaccented, so it causes the accent to be placed on the stem-final -i. When -i later turns to -y, its accent is transferred to the ending by (10b).¹⁸

We can now understand why the accent remains on the root in ablauting barytone disyllabic bases such as *sānu snúṣu* 'summit' (*sónu) and in the unique Greek γόνυ γνύσι 'knee', discovered by Forssman 1964 hiding as περ' ἰγνύσι in the Homeric *Hymn to Hermes*. (Forssman, followed by West in his edition, emends the accent to *γνύσι on theoretical grounds, but the present analysis vindicates the accent of the MSS.) For when weak case endings trigger zero grade in the stem by (8), the accent shifts one syllable to the right by (10b): /gónu/ → *gónu-sí* → (8) *gnú-sí* → (4) *gnú-si*. The stem accent of γνύσι contrasts with desinential accent in φρασί (> φρεσί), from the monosyllabic φρήν, φρενός 'mind' (*g^whren-); the original Greek derivation would have been /phren/ → *phren-sí* → *phrṇ-sí* → *phra-sí*.

Our analysis implies that a stem which is either inherently accented, or receives default oxytone accent by (5), will have fixed accent unless its accented syllable is desyllabified, in which case (10b) takes effect. This entails a contrast between inherent accent and lack of inherent accent in those monosyllabic stems that maintain their syllabicity in the weak cases. In Sanskrit, for example, *gó-* /gáu/ 'cow' has fixed accent (*gáuḥ*, *gávā*, *góbhiḥ*) whereas *nau-* /nāu/ 'boat' is movable (*nāuḥ*, *nāvā*, *naubhíḥ*). Though clearly needed for Sanskrit, the contrast is hard to nail down for Indo-European because of the scarcity of good comparative accentual data for root nouns, everywhere a dwindling class. If we do suppose that IE *g^wóu- and *neh₂u- differed accentually in the same way as their Sanskrit reflexes, it would have had derivations as in (11).

(11) Contrastive inherent accent in monosyllabic nouns

	g ^w óu-es	g ^w óu-éh ₁	g ^w óu-bhí-	neh ₂ u-es	neh ₂ u-éh ₁	neh ₂ u-bhí-
BAP	—	g ^w óu-eh ₁	g ^w óu-bhi-	neh ₂ u-es	—	—
(Sanskrit)	<i>gávaḥ</i>	<i>gávā</i>	<i>góbhiḥ</i>	<i>návaḥ</i>	<i>nāvā</i>	<i>naubhíḥ</i>

The long vowel in Nom.Pl. *gávaḥ* is due to Brugmann's Law, an Indo-Iranian process that lengthens -o- in open syllables. (I return to the formulation of Brugmann's Law in detail in section 2.3 below.)

¹⁷The genitive plural in high vowel stems and sonorant stems looks problematic at first sight, since it begins with a consonant and yet attracts the ictus: *pitṛ-nām*, *agnī-nām*. But -nām is a replacement for -ām, so historically, the derivation is *pitár-ām* → *pitṛ-ām* → *pitṛ-nām*. In Sanskrit, though, the morphology has become opaque and as a result the genitive plural has probably been reanalyzed as a dominant accented ending; hence *narām*, *nṛnām* vs. *nārā*, etc.

¹⁸Glide-formation applies at the word level, where extrametricality no longer applies. At the sentence level (in the postlexical phonology) the outcome is different: accents that lose their syllabic foothold are deleted, leaving behind a secondary pitch accent on a neighboring syllable (Sanskrit *svarita*, Slavic neoacute etc.).

Zero grade ablaut does not cause the loss of a syllable when the syllable peak is relocated to a tautosyllabic phoneme, and in that case no accent shift occurs. An example is *śván-* ‘dog’, an inherently accented ablauting stem. Zero grade induces no accentual mobility in it, whether before consonantal endings, as in /śván-bhís/ → *śvñ̥-bhís* → *śvábhiḥ*, or before vocalic endings, as in /śván-ā/ → *śúnā*.

(12)	Inflection	kuón-m̐	kuón-éh ₁	kuón-bhís
(8)		kuón-m̐	kún-éh ₁	kuñ̥-bhís
	BAP	kuón-m̐	kún-eh ₁	kuñ̥-bhis
	(> Sanskrit)	<i>śvánam</i>	<i>śúnā</i>	<i>śvábhiḥ</i>

Zero grade takes place before accented endings by (8), but the root syllable is retained, its peak being the vocalized coda nasal before consonantal endings, and the vocalized onset glide before vocalic endings. The accent therefore stays on the root syllable, and rule (10b) has no scope.¹⁹ The long vowel in Acc.Sg. *śvánam* is again due to Brugmann’s Law. Another such case is Skt. *dvāḥ* /*dvār*/, Nom.Pl. *dvāraḥ*, Du. *dvārau*, -ā, Acc.Pl. *dúraḥ* (contrast *dhūḥ* /*dhur*/ ‘yoke, pole’, Acc.Sg. *dhúram*, Nom.Pl. (*dur-*)*dhúraḥ*, Du. *dhúrau*, Acc.Pl. *dhúraḥ*, Instr.Sg. *dhurá*, Loc.Pl. *dhūrśú*).

The word **diéu-* ‘sky (god)’, ‘day’ makes an interesting comparison. The accent pattern is that of *disyllabic* nouns, with desinential accent in the vocalic weak cases and stem-final accent in the consonantal weak (“middle”) cases: Nom.Sg. *dyáuḥ*, Acc.Sg. *dyám*, Dat.Sg. *divé*, Instr.Sg. *divá*, and, importantly, Instr.Pl. *dyúbhiḥ*. Our rules derive the paradigm from an underlying disyllabic stem. Like all disyllables, underlying /*diéu-*/ receives an oxytone accent by (5), and the resulting /*diéu-*/ is inflected as follows.

(13)		diéu-s	diéu-m	diéu-éi	diéu-éh ₁	diéu-bhí-
	∅ grade	—	—	diu-éi	diu-éh ₁	diú-bhí-
	BAP	diéu-s	diéu-m	—	—	diú-bhi-
	(Sanskrit)	<i>dyáuḥ</i>	<i>dyám</i>	<i>divé</i>	<i>divá</i>	<i>dyúbhiḥ</i>

The disyllabic *diéu-* is not only required by the place of the accent in the middle cases; it is more directly manifested as well. There are 26 instances of metrically disyllabic *diáuḥ* in the Rigveda (25 of them *pāda*-initial), and several instances of *diám* (Sihler 2006: 80-81). A compelling datum is the *svarita* accent in the vocative *dyauḥ*,²⁰ which must be from from disyllabic /*diaus*/, with regular initial vocative accent (as in *pítaḥ* from *pítár-*), and postlexical glide formation leaving the post-tonic contour accent in its place (fn. 18).

Two case forms in this and other paradigms show variation: Gen.Sg. *diváḥ* ~ *dyóḥ*, and Loc.Sg. *diví* ~ *dyávi*. This is due to allomorphy in the case endings *-s/*-ós(*-és) and *-∅/*-i/*-í; more on this immediately below.

Sanskrit roots in which the nucleus *a* is preceded by a [+high] vocalic sonorant exhibit a syllabicity contrast. The sonorant may be syllabic /i/, /u/, as in *dyáuḥ* /*diáu-*/, *svāḥ* /*súar*/ ‘heaven’,

¹⁹At first glance the Greek cognate *κύων*, *κυνός* looks like an exception, but really it is not. Its inflected stem is monosyllabic *kun-*, even in the strong cases: *κύνα*, *κύνε*, *κύνες*, *κύνας*. In the weak cases, therefore, the accent quite properly falls on the ending. Apart from its suppletive nominative singular, it behaves exactly like any other basic uncontracted monosyllable in Greek. Nominative singular vs. all other case forms is the typical Greek innovative suppletion pattern, e.g. *ὄϊς*, *Ζεύς*, *ἦπαρ*, evidently having replaced the original strong vs. weak case pattern.

²⁰The first of a string of orthotonic vocatives *dyauḥ pítaḥ p̄ṭhivi mātár ádhrug ágne bhrātár vasavo m̄ṛítātā naḥ* ‘Father Heaven, guileless Mother Earth, brother Agni, you gods, have mercy on us!’ (*RV*. 6.51.5, oldest stratum).

or nonsyllabic /y/, /w/. An independent bifurcation in roots of this structure is between those whose nucleus is ablauting (*saṃprasāraṇa*), e.g. *śvan-* ~ *śun-* /śvan-/ ‘dog’, *dvar-* ~ *dur-* /dvar-/ ‘door’, and those whose nucleus is nonablauting, e.g. *tvak* /tvac-/ ‘skin’ (*tvacā*, *tvacāḥ*). Many of the latter are obviously innovative, cf. Instr.Sg. *ádhvān-ā* vs. *adhunā* ‘now’, so the treatment of glides may have been uniform in IE.

Returning to oxytones with fixed accent, another major class of cases that escape secondary mobility are those oxytone nasal stems in which loss of the syllable is regularly blocked by phonotactic constraints: Dat.Sg. *vṛtra-ghn-é*, *mūrdhn-é* vs. *ātmán-e*, *tmán-e*, *brah-mán-e*, *vid-mán-e*, Instr.Sg. *mahi-mn-ā* vs. *maj-mán-ā* ‘greatness’. For example, /vid-man-é/ with (8) could not be syllabified either as **vidm.né* or as **vid.mné*, hence the output is *vid.má.ne*.

Because ablaut depends on accent and not on ictus, the same ablaut pattern appears when the triggering desinential accent is occulted by an ictus to its left: /rāj-an-é/ *rājñe* vs. /bráh-man-é/ *bráhmane* (IE **/rēg-on-éi/ *rēgñei*, **/bhlégh-men-éi/ *bhléghmnei*). The role of syllable structure is made even clearer by the reappearance of secondary mobility in cases where the consonant cluster can be simplified, either by deletion, e.g. /ras-man-ā/ → *rasná* ~ *rasmánā* ‘rein’ (**rēk-men-éh₁*), Instr.Sg. /dā-man-ā/ → *dāmā* ‘gift’ (**déh₃-men-éh₁*), /bhū-man-ā/ → *bhūmánā* ~ *bhūmā* ‘abundance’ (**bhuh₁-men-éh₁*), or by degemination, e.g. Gen.Sg. /vas-ás-ás/ → *uśāḥ* ~ *uśásah* ‘dawn’. After the contraction *Vh* → *V̄*, the suffix vowel could delete with retention of the consonant, e.g. Gen.Sg. *dhāmnah*, Instr.Sg. *dhāmnā*, *bhūmnā*.

In the genitive singular, the ending *-es/-os* has an allomorph *-s*, which appears only in post-ictic position, and (in IE) only after a heavy syllable. E.g. acrostatic Gen.Sg. **dém-s* (Nom. **dom-s*, Acc. **dóm-m̄* > **dóm* ‘house’), *nék^w-t-s* ‘night’, Avestan Gen.Sg. *dāman* ‘place, creature’, from /dhéh₁-men-ós/ → **dhéh₁mens*²¹ (no zero grade since **dhéh₁mnos* was syllabically impossible). It is not predictable from zero grade ablaut, since endings were not subject to zero grade (Nom.Pl. *-es*, Dat.Sg. *-ei*, etc.), and also because the (morpho)phonological contexts in which it appears overlap with those of *-es/-os*. Therefore it is a separate independent allomorph of the genitive ending, whose distribution must be characterized at least in part morphologically. This will become important as we proceed to the proterokinetic and amphikinetic types below.

Before proceeding to the proterokinetic type, let us look more closely at Brugmann’s Law, the Indo-Iranian innovation responsible for the long *-ā-* in Nom.Pl. *gāvah* and Acc.Sg. *śvānam* ((11) and (12) above). I will argue that this process fits seamlessly into the account of ablaut developed here, and that some of its properties provide new confirmation for it. Readers interested in the reconstruction of the Indo-European accent/ablaut system may wish to skip this section and pick up the main thread in section 2.4 below.

2.3 Brugmann’s Law

The origin and nature of Brugmann’s Law is controversial. With Kuryłowicz, I believe it is not a sound change, but a morphophonological process that has been added to the inherited ablaut system within Indo-Iranian. It functions as the counterpart to zero grade, in the sense that it applies to the same set of vowels that can undergo zero grade — borrowing a term from Slavists, I’ll call them FLEETING VOWELS — but in the complementary contexts, when *not* followed by an accented morpheme. Like zero grade, it does not care about ictus (*pace* Holst 2004), it only cares about accent. It applies to *-o-* from any source (*pace* Lubotsky), including *-o-* derived from *-h₃e-* by

²¹In the paradigmatic analysis, proterokinetic Gen. **dh_h₁-mén-s* > **diman*, with full grade of the root later restored from the strong cases. See the next section for discussion.

laryngeal coloring, *-o-* derived from *-e-* by ablaut, and underlying *-o-*, provided only it can undergo zero grade. Jamison (1983, Ch. 10) comes closest to what I believe is the right formulation, based on a study of just one morphological category, causative verbs (see also Volkart 1994).

(14) *Brugmann's Law*

Fleeting *o* is lengthened in an open syllable when not followed by an accented morpheme.

a. Fleeting *-o-* lengthens

Acc.Sg. /pod-*m̥*/ **pód-m̥* > *pádam* ‘foot’ (*upa-bd-á* ‘stepping’, Av. *frabda* ‘foreleg’), **suésor-m̥* > *svásāram* ‘sister’ (Gen.Pl. *svásr̥nām*), **néptor-m̥* > *náptāram* ‘nephew’ (vs. **-er-m̥* in *pitāram* ‘father’, *mātāram* ‘mother’), **h₂ék-mon-m̥* > *ásmānam* ‘stone’ (ἄσμωνα ‘anvil’), **tétk-on-m̥* > *tákṣān-am* ‘carpenter’ (τέκτων-α), **g^wóu-es* > *gāvah* ‘bulls’ (βόες), *duór-es* > *dvārah*, **h₃op-es* > **óp-es* > *āpah* ‘waters’ (**dvi-h₂p-á* > *dvīpá-* ‘island’), Acc.Sg. *anaḍ-váh-am* ‘wagon-puller’, ‘ox’ (Dat. *anaḍ-úh-e*), *sók^w-h₂oi-m̥* > *sákhāyam* ‘companion’ (Dat.Sg. *sákhye*), **rēg-on-m̥* > *rājānam* ‘king’ (Instr.Sg. *rājñā*), **h₂ói-u-* > *áyu* (Av. *yaoš*, *yauuā*, *yauue*), **dóru-* > *dāru* ‘wood’ (Instr.Sg. *drú-ñā*, *dru-ṣád(-van-)* ‘perched on a tree’), **gónu-* > *jānu* ‘knee’, **sónu-* > *sānu* ‘back, ridge’, **k^wetuór-es* > **catvárah* ‘four’ (Acc. *catúr-aḥ*, Lat. *quattuor*), *vāhas-* ‘offer’, ‘thing brought’ (*vah-*), *nāman-* ‘name’ (**nóm̥-*, originally ablauting), 3.Sg.Perf.Act. **k^we-k^wór-e* > *cakāra* ‘do’ (Mid. *cakré*).

b. Fixed *-o-* does not lengthen

**póti-* > *pāti-* ‘lord’, **h₃eui-* → **oui-* > *avi-* ‘sheep’, **k^wóti* > *kati* ‘how many?’, **próti* > *prāti* ‘against’ (πρός), **pró-tero-* > Av. *fratarā-* ‘front’, **nómo-* > *náma-* ‘pasture’ (νόμος), both vowels in **h₃óp-os-* (Latin *opus*) *ápas-* ‘work’, *apás-* ‘working’ (Gen.Sg. *ápasah*, *apásah*), **tómos* > *támas-* ‘darkness’ (Lith. *tamsà*), **dómo-* > *dámah* ‘house’ (δῶμος, Latin *domus*), **somó-* > *samáh* ‘same’, **k^wók^wr-* > *sákr-* ‘excrement’ (χόπρος), **h₃ég^whi-* > *áhi-* ‘snake’ (ὄφις), **pro-bhu(h₂)-* > *prábhu-* ‘out-standing’ (Lat. *probus*), *nagná-tā* ‘nakedness’ (Russian *nagotá*), **rosa-* > *rása-* ‘juice’, (Lat. *rōs*, Lith. *rasà* OCS *rosa* ‘dew’), **h₃onos- ánas-* ‘(heavy) cart’ (Lat. *onus* ‘burden’), **stom̥-* ‘mouth’ > Av. *staman-*.²²

c. Variably fleeting *-o-* lengthens variably

**h₂us-os-* > Nom/Acc.Du. *ušás-ā* ~ *ušās-ā*, Gen.Sg. *ušáh* ~ *ušásah* ‘dawn’, **h₂uks-en-m̥* > *ukṣānam* ~ *ukṣānam*, Acc.Pl. *ukṣānah* ~ *ukṣñáh*. These cases are interesting because they show the synchronic operation of Brugmann’s Law going hand in hand with the synchronic operation of zero grade.²³

d. No lengthening before accented morphemes

Dat.Sg. **g^wóu-éi* > *gáve* ‘bull’, **pod-éi* > *padé* ‘foot’, Abl.Sg. **h₂ek-mon-ós* > *ásmanah* ‘stone’, **duoios* > *dvayáh* ‘twofold’ (δFοιός).

A contrast such as Instr.Sg. *gávā* versus Nom.Acc.Du. *gávā* (respectively from *gávā* and *gávā*) demonstrates vividly that Brugmann’s Law is not a sound change conditioned by a surface phonetic context but a morphophonological process sensitive to the underlying accent features of morphemes.

²²Oxytone *-tar-* (< **-ter-*) has adopted its lengthening from barytone *-tar-* (< **-tor-*), which has the same zero grade behavior. (New) Avestan *zāra-* ‘bile’ (χόλος), OPers. *kāra-* ‘army’ (Lith. *kāras* ‘war’) may be counterexamples, but the Iranian quantity is not wholly certain, and the latter may have been folk-etymologized to *kar-*.

²³The form *ukṣānam* is presumably secondary, after *rājānam*.

In causatives, *e* of the root was ablauted to *o*, which was then normally lengthened by Brugmann’s Law, e.g. *van- vājáyate* ‘strengthens’, *ghṛ- ghāráyati* ‘drizzles’. The causatives confirm in yet another way that Brugmann’s Law is conditioned by accent, and that applies regardless of where the ictus falls. The causative morpheme *-ay-/i-* is underlyingly unaccented, since it does not trigger zero grade on the root. Therefore it permits the preceding syllable to lengthen by (14). But *-ay-/i-* itself shows up as unaccented only outside of the present system, as in infinitives (e.g. *vāj-ay-á-dhyai* ‘to spur’), participles (*ghār-i-tá-* ‘drizzled’, gerundives (*pan-ay-áya* ‘to be admired’, fut. *dhār-ay-iṣyá-ti* ‘will support’, perf. *gamayám cakāra* ‘caused to go’). Before the unaccented present suffix *-a-*, *-ay-* itself gets accented, presumably by the Oxytone Role, and bears the ictus. The point of interest is that even when this happens, the root can still be lengthened. This can be modeled either by cyclic application of the phonology, or (as I have done in (14)) by direct reference to the underlying accentual features of morphemes.

Jamison (1983, Ch. 10), goes through the causatives of the Rigveda and Atharvaveda and finds that the exceptions to lengthening fall into a small number of groups, for each of which she proposes a fairly convincing explanation. One class of exceptions to lengthening consists of non-ablauting roots (roots with an invariant nucleus), such as *har-*, *prath-*, *śnath-*, *vyath-*. This generalization, astutely identified by Jamison from just one morphological category, is borne out by the rest of the system, and we have built it into (14).

A methodological virtue of Jamison’s study is that it takes care to distinguish Brugmann’s Law as a synchronic Vedic rule from the Indo-Iranian historical innovation by the same name. The distinction is vital because the syllable structure that conditions the process changes when the laryngeals are lost. Non-syllabic laryngeals counted as consonants for purposes of syllable structure in Indo-Iranian, so that the first syllable in CoC-HV and CoCH-V was closed and failed to lengthen by Brugmann’s Law. The short root vowel in the 1.Sg. Perfect (*jagáma*, vs. 3.Sg. *jagáma*) ‘went’ famously reflects a laryngeal in the 1.Sg. ending (**g^we-g^wóm-h₂e*), which must still have had a syllable-closing effect in Indo-Iranian at the point when Brugmann’s Law entered the language. Synchronically in Vedic, though, this ending is simply an exception to Brugmann’s Law. The distinction between CVCH roots and CVC roots does not survive in a systematic way. Productive morphophonological alternations tend to treat them alike. In the causative, the failure of lengthening in *janáyati* ‘begets’ is historically caused by the laryngeal in the ancestral **ḡonh₂-eĭ-e-ti*, but synchronically it just constitutes an exception to Brugmann’s Law. Innovative forms such as *tāráyati* ‘makes cross’ (< **torh₂-eĭ-e-ti* and and (*pārā*) *bhāváyati* ‘makes perish’ (< **bhōuh₂-e-i-e-ti*) are historically irregular because the laryngeal originally blocked Brugmann’s Law, but synchronically it is a regularization of the morphophonological lengthening process. On the other hand, before nasal consonants, the laryngeal that blocked lengthening happened occur in so many roots that the entire class of nasals comes to block Brugmann’s Law, so that, for example, historically regular *gāmáyati* ‘causes to go’ is replaced by synchronically regular *gamáyati*.

The pattern of lengthening of the root vowel in primary *a*-stem derived nouns is extremely complex. Hajnal 1994 has shown that the Vedic data can be reconciled with the historical operation of Brugmann’s Law, although many item-specific and semi-systematic changes have almost submerged the original distribution of length. The accentual restriction on Brugmann’s Law proposed here somewhat simplifies the picture, although many loose ends remain.

The starting point is the Indo-European contrast between barytone action/result nouns and oxytone agent nouns: *ápas* (n.) ‘work’ vs. *apás-* ‘working’, *éṣa-* ‘hurry’ vs. *eṣá-* ‘hurrying’, both with *-o*-grade (Greek φόρος ‘tribute’, φερός ‘bringing’). By (14), we then expect lengthening to *CáCa-* in action/result nouns as opposed to retained *CaCá-* in agent nouns. Such indeed appears to

have been the case in Indo-Iranian, but a number of changes in accent and quantity have obscured the original distribution.

Keep in mind that (14) was not a neogrammarian sound change, but an analogical extension of the ablaut system. Therefore it applies only to nouns which were, at the time the process entered the language, synchronically derived from ablauting roots. This restriction accounts for the retention of the short vowel in a number of nouns and adverbs which can no longer be compositionally derived from their original root, or whose root has been lost altogether: *dāma-* ‘house’, *āya-* ‘throw of the dice’, *āram* ‘enough’, ‘suitably’, *kṣāya-* ‘abode’, *tāna-* ‘progeny’, *nāma-* ‘pasture’, *bhāga-* ‘prosperity’, ‘happiness’, ‘love’, *bhāra-* ‘booty’, ‘battle’, ‘offering’. For Hajnal, the short vowel in all these words has been restored by analogy to nouns derived from laryngeal roots, such as *grābha-* ‘capture’ (**ghrebhH-*), *hāva-* ‘invocation’ (*ḡheuH-*), where Brugmann’s Law was never applicable in the first place. The number of short-vowel nouns requiring such an analogical derivation is much reduced in our analysis, and mainly needed for cases where the analogy is strongly supported: *stāva-* ‘praise’ is reasonably taken to be modeled on *hāva-* ‘invocation’, and *yāma-* ‘reins’ follows the pattern of the many other nasal roots with laryngeals, such as *krāma-* ‘step’, *śrāma-* ‘fatigue’, *āma-* ‘onrush’, *jāna-* ‘person’, ‘race’, *rāṇa-* ‘battle’ (the same kinds of cases that maintain a short vowel in the causatives mentioned above). Isolated exceptions with no obvious model are *vāsa-* ‘wish’ and *hāsa-* ‘laughter’.

Otherwise the length is retained in action/result nouns that are transparently related to their root. But only a few of them preserve the original root accent as well: *svāpa-* ‘sleep’ (*anu-svāpam* ‘sleepily’), *śāka-* ‘power’, *vāja-* ‘power’. Most nouns with *-ā-* move the accent to the end: *sādā-* ‘(act of) riding’, *pārā-* ‘boundary’, ‘opposite side’, *tyāgā-* ‘renunciation’, *gāhā-* ‘depth’, *nāvā-* ‘panegyric’, *bādhā-* ‘harassment’, *bhāgā-* ‘share’, *bhārā-* ‘load’, *vākā-* ‘recitation’, ‘formula’. This is a characteristic of roots with long *-ā-* only. In action/result nouns with roots of other shapes, the accent remains on the root: *vēda-* ‘knowledge’, *mó(g)ha-* ‘foolishness’, *krānda-* ‘cry’, *kālpa-* ‘custom’, *dakṣa-* ‘insight’ etc. Pāṇini duly noticed this generalization and formulated a special accent rule for it (6.1.159), which requires the normally unaccented action noun suffix *GHañ* to be accented just in case the root has *-ā-*. This accent shift renders Brugmann’s Law completely opaque in action nouns: paradoxically, it erases the accent that conditioned the length that triggers the shift itself. However, both the shift and its conditioning is understandable. It conforms to a general drift towards oxytonesis in derived nouns, and its operation after roots in *-ā-* was facilitated by the fact that in these cases, and only in these cases, action nouns were distinguished from agent nouns by the shape of the root, with a long vowel in action nouns and a short vowel in agent nouns. Had the shift applied to roots of other shapes, it would have merged the distinction between them. For example, *éṣa-* ‘hurry’ and *eṣā-* ‘hurrying’ would have fallen together.

By our hypothesis, agent nouns in *-a-* (including instruments), being oxytone, were never subject to Brugmann’s Law. And indeed their root vowels are mostly short (P. 3.1.134-5): *ajā-* ‘driver’, *karā-* ‘doer’, ‘hand’, *ghanā-* ‘destroyer’, ‘mace’, *dravā-* ‘running’, *dhvajā-* ‘flag’ (‘waver’), *nadā-* ‘roarer’, ‘bull’, *plavā-* ‘boat’, *pravā-* ‘flying’, *bhramā-* ‘flickering flame’, *valā-* ‘helmet’, ‘enclosure’, *sahā-* ‘victorious’. Hajnal, who assumes that Brugmann’s Law applies across-the-board without any accentual conditioning, again posits analogy to the short vowel in agent nouns in *-á-* from laryngeal roots, this time more unconvincingly because the putative models make up so small a minority of agent/instrument nouns in *-á-* that it is hard to see how they could have influenced the others.

For the long-vowel agent/instrument nouns that do lengthen (or fail to shorten analogically), namely *pārā-* ‘crossing’, *śrāyā-* ‘endowed with’ (‘leaner’), *svārā-* ‘sounding’, *hvārā-* ‘snake’

(‘wiggler’), *vāhá-* ‘riding’, ‘driving’, *sāká-* ‘helper’, *sāhá-* ‘victorious’, *vāra-* ‘(soma-)strainer’²⁴ I follow Hajnal’s explanation based on a rhythmic alternation found in determinative compounds. Many agent nouns are originally second members of synthetic compounds (compounds in which the first member is a complement of the verbal root contained in the second member), or determinative compounds with adverbial first members. Such compounds show a pervasive rhythmic alternation at the compound boundary. The basic rule (P. 3.2.1, 3.2.29-46) is that the root vowel is long when the first member ends in a short vowel *-a-*, and long when the first member ends in a consonant (which is most often a case ending). Thus, the root vowel is long in *brahma-kārá-* ‘performing prayer’, *ati-yāj-á-*, *uda-vāhá-* ‘water-carrier’, *sarva-śāsá-* ‘ruling over all’, and the root vowel is short in *abhayaṃ-kará-* ‘making fearless’, *vājaṃ-bhará-* ‘carrying off the prize’, *purāṃ-dará-* ‘fort-destroyer’, *rathaṃ-tará-* ‘chariot-impelling’, *makṣuṃ-gamá-* ‘coming quickly’, *vṛtaṃ-cayá-* ‘piling up enemies’, *punaḥ-sará-* ‘flowing again’, *saṃ-sravá-* ‘flowing together’. (There are exceptions in both directions, but this is the regular distribution.) Brugmann’s Law would not have been applicable to any of these words because of the final accent. The short root vowel in words like *rathaṃ-tará-* therefore needs no further justification, but the long root vowel in words like *brahma-kārá-* does. It must be due to lengthening in satisfaction of the preference for a rhythmic alternation between long and short vowels. The lengthened second member of a compound such as *uda-vāhá-* ‘water-carrier’ or *yūpa-vāhá-* ‘post-carrier’ can then become used on its own, resulting in *vāhá-* and the other long-vowel nouns listed above.

The remaining class of cases is the type *su-kāra-* ‘easy to do’, *su-bhára-* ‘easy to carry’, *duḥ-śāha-* ‘hard to resist’, regularly with a short vowel.²⁵ Why does neither the rhythmic lengthening process nor Brugmann’s Law apply to the root vowel in these compounds? The reason rhythmic lengthening does not apply to them is that they are bahuvrīhi compounds and not determinative compounds, and we know that for some reason the rhythmic lengthening did not apply in bahuvrīhis (e.g. *sahāsra-bhara-* ‘having thousandfold booty’). As for Brugmann’s Law, the Greek counterparts suggest that this type was originally accented on the first member, e.g. εὐφορος ‘easy to bear’, type δύσκολος ‘hard to please’ (with recessive accent, originally by the BAP).²⁶ In that case, the modal adjectives in question must be formed with an unaccented dominant derivational suffix (see section 4.2). If Brugmann’s Law as formulated in (14) antedated the stress shift, it would have been inapplicable to these forms, and their short vowel would be in order.

I believe (14) is the cleanest version of Brugmann’s Law so far. The two key elements are that it did not simply apply as a sound law to **-o-* in open syllables, but (as Kuryłowicz argued) constituted an extension of the synchronic morphophonological ablaut system of Indo-Iranian. Qua ablaut, it was conditioned by accent rather than ictus, and constituted the “elsewhere case” to the zero grade rule. Compared to previous formulations, this substantially reduces the analogical reshuffling of vowel length that must be posited for Sanskrit. If correct, it adds a measure of support for the compositional approach to accent and ablaut.

2.4 The proterokinetic type

Most *i-* and *u-*stems are reconstructed as proterokinetic according to the schema in (1), with full grade *é* in the Root in the strong cases, and in the Suffix in the weak cases. Against this view,

²⁴Originally ‘wool’, ‘horsetail’ (Lith. *vālas*), but apparently felt to be derived from *vṛ-* ‘cover’, ‘restrain’, ‘withhold’. If this is right, then the instrumental meaning ‘strainer’ must be of Indo-Iranian date.

²⁵Synchronically in Vedic, this type not only blocks lengthening but undergoes shortening of underlying long vowels, e.g. *dur-gāha-* ‘impenetrable’, ‘difficult’ (from *gāh-* ‘penetrate’).

²⁶Is *dur-māra-* ‘clinging to life’ (‘hard-dying’) = *Il.* 22.60 δύσμορος?

I shall argue that they are not mobile but fixed, that the ablaut is syllabically conditioned, and that the proterokinetic type as defined in (1) did not exist.

Table (15) compares the reconstruction of the paradigmatic analysis (first column) with that of the compositional analysis (second column) using the word for ‘son’. The forms are divided into strong and weak cases (the factor that determines the form of the Suffix according to the paradigmatic analysis) and into those that begin with consonants and those that begin with vowels (the factor that determines the form of the Suffix according to the compositional analysis).

(15)		paradigmatic	compositional	examples
	Strong cases:			
-C	Nom.Sg.	séuh-nu-s	suh-nú-s	Skt. <i>sūnúḥ</i> , Greek <i>πῆχύς</i> , OCS <i>synŭ</i>
-C	Acc.Sg.	séuh-nu-m	suh-nú-m	<i>sūnúm</i> , <i>πῆχύν</i> , <i>synu</i>
-V	Nom.Pl.	séuh-n(u)ṽ-es	suh-néṽ-es	<i>sūnávah</i> , <i>πῆχέες</i> , <i>synove</i>
	Weak cases			
-C	Acc.Pl.	suh-néṽ-ns	suh-nú-ns	<i>sūnún</i> , Goth. <i>sununs</i> , <i>syny</i>
-V	Dat.Sg.	suh-néṽ-ei	suh-néṽ-ei	<i>sūnáve</i> , <i>πῆχέι</i> , <i>synovi</i>
-V	Gen.Sg.	suh-néu-s	suh-néu-s	<i>sūnóh</i> , Goth. <i>sunaus</i> , <i>synou</i>

The compositional analysis, which goes back at least to Saussure, matches the daughter languages better with respect to accent and ablaut. First, the root in *i*- and *u*-stems does not alternate between full and zero grade. Most often (as in this noun), it has fixed zero grade; in some words it has fixed full grade. Secondly, the proterokinetic accent alternation between Root and Suffix does not appear in the daughter languages; it is in effect inferred from the ablaut patterns it is assumed to have conditioned, which however are themselves dubious. Third, the full and reduced form of the suffix (*-neu-* ~ *-nu-*, in (15)) are not distributed according to strong and weak cases. Rather, zero grade is found before case endings that begin with a consonant, and full grade before case endings that begin with a vowel (Saussure’s *loi de la flexion faible*, 1879: 205). For example, in the strong cases the suffix has zero grade in the nominative and accusative singular, and full grade in the nominative plural, and in the weak cases the suffix has zero grade in the accusative plural, and full grade in the dative singular. Oddly, the genitive singular *-s/* selects the same stem as the vocalic endings, in line with its basic form */-es, -os/*. This would follow if the allomorph */-s/* requires a preceding heavy syllable.²⁷

In general, as discussed in the preceding section, the distribution of full and zero grade in Indo-European responds to two conditioning factors: accent (the zero grade rule (8)), and syllable structure, as is patently the case for *n*-stems. Which of these determines the distribution of full and zero grade in the suffix of *i*- and *u*-stems? From the fact that it correlates with whether it is followed by *-C* or *-V*, and not with whether the ending is accented or not, we conclude that it is, in this case, governed by syllable structure.

To be sure, the relation of ablaut to syllable structure in *i*-/*u*-stems differs from the one in *n*-stems in two ways. First, their inflection is sensitive to the root syllable’s weight, in a pattern suggestive of Sievers’ Law, rather than simply depending on the consonantal phonotactics as in the *n*-stems. Secondly, the zero grade before consonantal endings, even in the strong cases, has no analog in *n*-stems. In previous explorations of this line of analysis, *-i-*, *-u-* has been taken as basic and the fuller form derived from it, by lowering of a Sievers-vocalized glide (Szemerényi 1980:

²⁷Note also that this keeps the genitive and nominative from falling together.

190) or anaptyxis (Kiparsky 1973). An original derivation /suhnu-éi/ > *suhnuéi would then have given way to /suhnu-éi/ (> *suhnúuei) > *suhnéuei. Even in the classic “proterodynamic” paradigm Nom. *āiū* ‘life’, Gen. *yaoš*, Instr. *yauuā*, Dat.Sg. *yauuōi*, *yauuē* (Hoffmann & Forssman 1996: 133), the posited earlier stage seems to survive in αἰFέι ‘always’ (< *h₂iūéi < *h₂oiū-éi) (Wodtko-Irslinger-Schneider 2008: 281, Lipp 2009: 109).²⁸

Tying the proximate ablaut pattern of *i*- and *u*-stems to syllable structure as in (15) has several major advantages. First, it provides an immediate rationale for the fact that the open inflection of the type *péku- ‘cattle’ (Skt. *pásu*, *pásve*), *pitú- ‘food’ (*pitu*, *pitváḥ*) *alí- ‘stranger’ (*arí*-, *aryáḥ*), *h₃owī- ‘sheep’ (*ávi*-, *ávyah*), *krétu- ‘power’ (*krátu*-, *krátve*), *póti- ‘lord’ (*páti*-, *pátye*) is represented exclusively by (C)VCV stems. In stems with this syllable structure, there was no phonological advantage for the heavy allomorph *-eu-*, and we can assume that light stems originally had the open inflection in *-u-*. When the phonological distribution of allomorphs became opaque (due to the contraction of vowels with laryngeal consonants $Vh > \bar{V}$, among other causes) the full-grade subdeclension spread throughout the *i*- and *u*-stems, leaving behind only a small residue of common words with open inflection. The proterokinetic hypothesis does not account for this distribution because it makes no connection with syllable structure.

In addition to matching the attested reflexes of the case forms well, the compositional reconstruction fits the system of the daughter languages better than the proterokinetic reconstruction does. It does not posit an accent alternation between stem and suffix, which is not attested anywhere. By assuming a fixed accent, either on the stem or on the suffix, it explains why the Root ablaut and accent in any given *i*- and *u*-stem is fixed. Even *non-alternating* stems going back to strong case forms like *séuh-nu- are rare, mostly appearing in laryngeal roots (Lubotsky 1988), where their distribution parallels that of *-tó-* forms (Vine 2004), and indeed of root nouns, e.g. *-dā-*, *-mā-*, *śās-*, *bhrāj-*, like *-dā-ti-*, *-mā-ti-*, *rā-tí-*, *śās-ti*, *bhrāṣ-ṭi-*. Not only do actual nouns of this type never show the ablaut alternations in the root, but the surviving reflexes often don’t match either supposed alternant. The model seems to imply such IE inflections as Nom.Sg. *dhéh₁-ti-s, Nom.Pl. *dhéh₁-ty-es, Gen.Sg. *dhh₁-téi-s, Instr.Sg. *dhh₁-téy-h₁ ‘placement’, but Greek has *dhéh₁ti (θέσις) rather than expected **θῆσις or **θεσείς, Germanic has *dheh₁tí (*deed*, German *Tāt*, rather than *deeth and *Tād), and Sanskrit has *-(d)hiti-*. Such variation shows that root ablaut and accent was leveled separately in each daughter language, which implies that the proterokinetic type of inflection would have had to persist into the individual branches of Indo-European. But then it is strange that it was eliminated so thoroughly in all of them.

Another major site of proterokinetic inflection are neuter sonorant stems. Schindler (1975a: 9) takes genitives in *-s* as establishing beyond doubt that a class of neuter *-r/-en* stems had a proterokinetic inflection of the form Nom./Acc.Sg. *TRéT-r*, Gen.Sg. *TRT-én-s*, Loc.Sg. *TRT-én*. Reflexes of **-en-s* are found in Avestan (though not with a zero grade root) in Gen.Sg. *rāzəng* (< I-Ir. **rāzan-s*, Nom.Sg. *rāzarə* ‘order’), Gen.Sg. *aiiṇ* (< I-Ir. **ayan-s*, Nom.Sg. *aiiarə*) ‘day’, Gen.Sg. *x^vəng* (< I-Ir. **suwan-s*, Nom.Sg. *huuarə*) ‘sun’ (Forssman & Hoffmann 1996: 153).

But these heteroclitic stems actually do not conform to the proterokinetic type. Their *vocalic* weak cases regularly have the suffix in zero grade form *-n-*: Gen.Pl. *asnqm* ‘day’, *rāšnqm* ‘order’,

²⁸Alternatively, if we think of the full and zero grade of the stem as being allomorphs (in historical terms, that the suffix is a conflation of two originally distinct suffixes, rather than being derived by sound changes from a single suffix), we can say that the choice between the allomorphs is made in such a way as to optimize syllable structure: Dat.Sg. *suhnéuei and Nom.Pl. *suhnéues are preferred to **suhnúeí, **suhnúés because they avoid the complex onset or coda that syllabification of the latter would require, and Nom.Sg. and Acc.Sg. *suhnús*, *suhnúm* are preferred to **suhnéus, **suhnéum because they avoid the extra-heavy syllable. All these analyses seem possible but none is particularly compelling.

Instr.Sg. *rašnā*, Loc.Sg. *asni* ‘day’. Once again, the crucial factor is not accent but syllabicity. The generalization is that the weak case endings are accented whenever they are syllabic (... -*n-Ů*-) — in other words, whenever they can bear an accent — and then induce zero grade on the stem. Otherwise they are preaccenting (... -*én-C*, ... -*én-∅*)²⁹. But we have seen this generalization already. It is the basic regularity behind inflectional accent and ablaut: that desinences are accented if possible, and if accented induce zero grade on the stem if possible. Therefore, as long as we posit that this class of sonorant stems takes the allomorphs *-s* of the genitive and/or *-∅* of the locative in place of the respective longer endings *-es/-os* and *-i*, the entire pattern follows from the rules we already have:

- (16) a. IE /*rēg-en-óm*/ → **rēgnóm* > I-Ir. **/rāz-an-ám*/ → **rāznám* → Av. *rāšnām*
 b. IE /*rēg-en-s*/ → **rēgéns* > I-Ir. **/rāz-an-s*/ → **rāzáns* → Av. *rāzəng*

The barytone counterparts of these stems (such as RV. *rājan-* ‘king’) have the identical accent alternation, except that the initial accent receives the ictus by the BAP, masking the accents on the suffix and desinence. The covert accents however are very much in evidence because they induce the identical ablaut.

The standard analysis differs radically. It assumes, on the strength of the genitive singular, that the accent in all weak cases is predesinential, and that it triggers zero grade on the desinence. We only need to look at the entire paradigm to see that this is backwards. Neither the accent rule nor the ablaut rule works. There is no evidence of predesinential accent before vocalic weak endings, and there is no evidence for a general desinential zero grade process. The short genitive singular allomorph *-s* and the short locative singular allomorph *-∅* are not derivable from the longer ones by general phonological rules, nor are the contexts in which they occur definable in purely phonological terms. Moreover, their respective distributions do not coincide: in Vedic, some *-ī* and *-ū* stems have zero locatives but none of them have *-s* genitives, and some *-i* and *-u* stems have *-s* genitives but none of them have zero locatives (similarly Av. *aiiqn*, *asni* ‘day’).

In short, what is called proterokinetic inflection in *-n* stems has little in common with what is called proterokinetic inflection in *-i* and *-u* stems. Apart from the genitive singular ending, with a stem form whose accent and ablaut falls out directly from the regular morphophonology, the “proterokinetic” inflection of the *-n*-stems is actually identical to that of ordinary *-n*-stems discussed in the previous section.

These conclusions are confirmed by non-heteroclitlic neuter *-n* stems. They also have *-s* genitives in Avestan, such as *dāman* ‘place, creature’ (< **dāman-s*, IE **dhéh₁mens*), *cašməng* (< **cašman-s*) ‘sight’, *barəsmən* ‘sacrificial grass’ (Forssman & Hoffmann 1996: 143). In the other weak cases, the distribution of *-n/-an-* seems to be syllabically governed much as in Sanskrit, e.g. Instr.Sg. *barəšna* (OP *baršnā*) ‘in height’ vs. Gen.Pl. *cašmanā*, paralleling Sanskrit *sīrṣṇā* ‘head’ vs. *ásmanā* ‘stone’. The paradigmatic analysis reconstructs a proterokinetic **dhh₁-mén-s* > **dimən*, **dhh₁-mén-eh₁* > **dimanā*, with full grade of the root later restored from the strong cases, and *TRT-én-* throughout the weak cases, does not fit the Vedic and Avestan data well. Our derivation accounts for the attested forms directly: /*dhéh₁-men-s*/ → (5) **dhéh₁méns* → (BAP) **dhéh₁mens* > *dāman*, /*bhérgh-en-éh₁*/ → **bhérghnéh₁* → **bhérghneh₁* > *bar(ə)šnā*.³⁰

²⁹Diachronically located between the **-∅* locative and the later **-i* locative which behaves as a regular weak case is the unaccented (preaccenting) *-i* locative (RV. *āhani*, *rājāni*), standardly assumed to originate as a deictic locative clitic.

³⁰Or from **bhérgh-men-* with cluster simplification (like Vedic *rašnā*), Wodtko-Irslinger-Schneider 2008: 32.

Here as elsewhere it is necessary to analyze entire paradigms and to separate item-specific morphology and allomorphy from general morphophonological processes. In reconstructions, the genitive singular commonly figures as a stand-in for the weak case forms. This is convenient because it is so frequent in texts, but it is also risky because it has unique properties: it is the only case ending that alternates between full and zero grade (apart from the instrumental singular, which does so under different conditions). The distribution of the genitive singular allomorphs is at least partly *morphologically* controlled, so using it to diagnose the *morphophonological* accent and ablaut patterns of the entire class of weak cases is unwarranted. In the *n*-stems, it seems to me, it yields a mirage.

A deconstruction of the proterokinetic type should be welcome, because it is not found in any daughter language, does not account for the attested paradigms well, lacks typological parallels even outside Indo-European, and is theoretically refractory, at least if we adopt the compositional approach.

2.5 The amphikinetic type

In this section I will argue that some lexical nouns do not undergo the Oxytone Rule. Their strong case forms then get initial accent by the BAP, the way that root nouns do. This is AMPHIKINETIC accent.

The Sanskrit amphikinetic stems (*púmāṃs-am puṃs-ā* ‘male’, *pánthān-am path-ā*) ‘road’ are peculiar in several ways. One is that they have a barytone strong stem and an oxytone weak stem. The simplest way to characterize their idiosyncrasy is to stipulate that the Oxytone Rule does not apply to them.³¹ The weak cases must then manifest the underlying accent of the desinence, while strong cases will receive initial accent by the BAP. The stem is weakened before accented endings by (8), and strengthened before unaccented endings by an Indo-Iranian rule that lengthens vowels before nasals in strong cases.³²

(17)	Stem	pumans	pumans	pumans
	Inflection	pumans-am	pumans-ā	pumans-sú
	Ablaut (8),	pumans-am	pumns-ā	pumn-sú
	BAP (4)	púmans-am	—	—
	(Sanskrit	<i>púmāṃs-am</i>	<i>puṃs-ā</i>	<i>puṃ-sú</i>)

An example of the amphikinetic type in a transparent tripartite Root–Suffix–Desinence structure is Nom.Sg. /dheḡh-om-s/ **dhéḡhōm*, Acc.Sg. /dheḡh-om-m̥/ **dhéḡhōm*, Gen.Sg. /dheḡh-om-és/ **dhḡh-m-és*, Hittite *tēk-an*, Gen.Sg. *tak-n-āš* ‘earth’, where the accent is revealed by the plene writing (Melchert 1994: 187 *et in litt. binis*, Lipp 2009: 45-132).

Most instances of the amphikinetic type cited in the literature do not actually have the amphikinetic mobile accentuation, but are either oxytone (with secondary mobility if and only if reduction to zero grade takes effect), or barytone, and probably were so in IE too. Oxytones with secondary mobility that have been considered amphikinetic include **wed-ōr-*, **ud-n-és* ‘water(s)’

³¹Technically one could also specify their strong stem as inherently accented on the first syllable. This alternative is fairly natural for the amphikinetic nouns that are heteroclitic, and would even makes sense of the fact that most amphikinetic nouns have a morphologically suppletive strong case stem. In fact, Instr.Pl. *pathíbhiḥ* actually requires it. Amphikinetic nouns that are inflected from a single stem, however, are a different matter. For them, stipulating special accentual properties for either the weak or the strong cases would compromise the compositional approach.

³²The underlying form is given in its Sanskrit shape, but it may not be far from the IE prototype if the etymology **pu-mans-* ‘male (Latin *mas-culus*) of reproductive age (Latin *pūbēs*)’ is correct.

(Hitt. *widār*, Skt. *udnāḥ*), Hitt. *ḥaštāi*, Gen.Sg. *ḥašt(i)yaš* ‘bone(s)’ (Melchert, *ibid.*), **h₂us-ós-*, **h₂us-s-és* ‘dawn’ (Nom/Acc.Du. *ušás-ā* ~ *ušás-ā*, Gen.Sg. *ušáh* ~ *ušásah*, ῥῶς Acc. ῥῶ). Fixed barytones that have been considered amphikinetic include **népōt-* ‘grandson, sister’s son’ (Acc.Sg. *nápāt-am* Dat.Pl. *nád-bhyaḥ*, Avestan *napātəm*, *naptō*, *naḥšu*, Forssman & Hoffmann 1996: 139-40), and a very large class of *-i*, *-u*, *-r*, and *-n* stems (Widmer 2004: 50-51), such as *rājan-* *rājñah* ‘king’.

These pseudo-amphikinetic oxytones and barytones can be analyzed like the *-r* stems in (9).

(18)	$h_2\underset{\cdot}{u}es-ós$	$h_2\underset{\cdot}{u}es-ós$	$h_2\underset{\cdot}{u}es-ós$	<i>népot</i>	<i>népot</i>	<i>népot</i>
Ablaut	$h_2\underset{\cdot}{u}s-ós$	$h_2\underset{\cdot}{u}s-ós$	$h_2\underset{\cdot}{u}s-ós$	—	—	—
Inflection	$h_2\underset{\cdot}{u}s-ós-m̄$	$h_2\underset{\cdot}{u}s-ós-és$	$h_2\underset{\cdot}{u}s-ós-bhís$	<i>népot-m̄</i>	<i>népot-és</i>	<i>népot-bhyós</i>
Oxytone	—	—	—	<i>népót-m̄</i>	<i>népót-és</i>	<i>népót-bhyós</i>
Ablaut	$h_2\underset{\cdot}{u}s-ós-m̄$	$h_2\underset{\cdot}{u}s-s-és$	—	<i>népót-m̄</i>	<i>népt-és</i>	<i>népt-bhyós</i>
BAP	—	—	$h_2\underset{\cdot}{u}s-ós-bhis$	<i>népōt-m̄</i>	<i>népt-es</i>	<i>népt-bhyos</i>
(Sanskrit)	<i>uśásam</i>	<i>uṣ(as)áh</i>	<i>uśádbhīḥ</i>	<i>nápāt-am</i>	<i>nápt-aḥ</i>	<i>nád-bhyaḥ</i>

As in (12) *śvan-*, the weak cases of *nápāt-* are immobile even though the weak stem is always monosyllabic. I assume that zero grade applies cyclically to the root+suffix combination before it enters inflection as a stem, and that syllable structure blocks the application of zero grade in $/h_2us-ós-bhís/ \rightarrow *h_2ussbhís$ (although by later rules this would ultimately give **udbhīḥ*, a perfectly well-formed word in Sanskrit).

Just as paradigmatic analyses reconstruct these fixed accent paradigms as amphikinetic, so conversely they often reconstruct amphikinetic accent paradigms as fixed, also for ablaut reasons. Sanskrit has a number of accentually amphikinetic heteroclites with suppletive barytone strong stems and oxytone weak stems, such as *yákr̥t yaknāḥ* ‘liver’ (Latin *iecur* ~ *iocur*, *iecinoris* ~ *iocineris*). According to the most widely accepted reconstruction (Eichner 1973, Schindler 1975a), this heteroclitic word was acrostatic, though Rix (1965) considered it amphikinetic and Beekes (1985) considered it proterokinetic.

Sanskrit (and Persian *jigar*) point to an IE heteroclitite with a strong stem $/\underset{\cdot}{i}ek^w-r-/$ and a weak stem $/\underset{\cdot}{i}ek^w-en-/ > *i\underset{\cdot}{e}k^wn-$.

(19)	$\underset{\cdot}{i}ek^w-r̥$	$\underset{\cdot}{i}ek^w-en$
Inflection	—	$\underset{\cdot}{i}ek^w-en-ós$
Oxytone	—	—
Ablaut	—	$\underset{\cdot}{i}ek^w-n-ós$
BAP	$\underset{\cdot}{i}ék^w-r̥$	—
(Sanskrit)	<i>yákr̥t</i>	<i>yaknāḥ</i>

ῥῖπαρ and Av. *yākarə* cannot be derived from the same base forms, as our rules stand. They require a different ablaut form, with a long root vowel.

This treatment of amphikinetic accentuation is also appropriate for the Balto-Slavic type of mobility between initial and desinential syllables. This raises the interesting possibility that inherited oxytones might have become mobile in Balto-Slavic by generalizing amphikinesis. If the Oxytone Rule ceased to apply to stems, the result would have been the merger of oxytone stems with unaccented stems into a unified amphikinetic mobile class (Lithuanian accent class III and

IV). Here is how it would have worked for the reflex of **dhugh₂ter-* ‘daughter’ in the Instrumental Plural (Weak) and Nominative Plural (Strong).³³

(20)	Stem	dukter-	dukter-
	Inflection	dukter-mís	dukter-es
	BAP	—	dúkter-es
	(> Lith.	dukterimìs	dùkteres)

The Oxytone Rule appears to have continued to apply in Balto-Slavic in larger morphological domains, however. Dolobko’s (or Vasil’ev-Dolobko’s) Law is in effect a word-level Oxytone Rule. It states that an enclitic following a movable (i.e. inherently unaccented) word gets accented, even if a proclitic (which otherwise would receive the accent) precedes the word. Jasanoff (2008: 364) illustrates its operation with an Old Russian example from Lehfeldt 2001:³⁴

- (21) a. stvóru
 b. né stvorju
 c. stvorju žè
 d. ne stvorju žè

Here the Oxytone Rule applies to enclitic groups, pre-empting in (20d) the BAP, which would otherwise accent the first syllable, as it does in (20b).

2.6 Synchrony and diachrony

The accent/ablaut typology in (1) is well-defined, but its customary application can be confusing. The daughter languages have systematic mismatches between surface accent and ablaut in stems of every kind — root nouns, *i-* and *u-*stems, *r-* stems, *n-*stems (as well as compounds, to be discussed below). Current practice is to dismiss such mismatches as innovations, usually by taking suffixal ablaut as the true diagnostic of the original type. The primacy accorded to suffixal ablaut seems to rest on two assumptions: (1) that all zero grade ablaut alternations in inflection were originally conditioned by accent, and (2) that in those attested inflectional paradigms where ablaut and accent diverge, suffixal ablaut is original, whereas root ablaut and word accent may be innovative. By (2), suffix ablaut would be a trustworthy guide to original word accent, and therefore by (1) also to original root ablaut. Privileging it in the reconstruction of inflectional paradigms would then make good historical sense.

However, neither assumption is self-evident. For example, even an adherent of the paradigmatic approach could reasonably believe that, on the contrary, *rájān-* has always been acrostatic and that its suffixal ablaut has been remodeled on the basis of the suffixal ablaut of “hysterokinetic” stems like *mūrdhān-*. This may be false, but it is not obviously absurd. And the compositional analysis advocated here casts doubt on both assumptions. We have argued that, contrary to assumption (1), ablaut is not determined by the word accent (ictus) but by morpheme accents. And there is also a class of cases where even the ictus itself is conversely conditioned by zero grade, namely what I called secondary mobility. And assumption (2), that ablaut is the more reliable criterion for the

³³That the retraction was not a “sound change” is shown by the fact that it did not apply to the accent assigned by derivational morphemes, e.g. Lith. *gyvāta*.

³⁴The distinction between acute and grave is apparently just an orthographic convention.

original type, is contradicted by clear instances of innovative ablaut with conservative accent. For example, in so far as zero grade is synchronically constrained by syllable structure, phonological changes that affect syllable structure have brought about corresponding changes in ablaut without necessarily involving any accentual shifts (section 2.2). If any of these things are true, then attested ablaut is not a reliable shortcut to original accent.

This also means that applying the four types in (1) to the daughter languages prejudices the issue, so that it would be safer to use a more non-committal terminology. Moreover, the IE typology is not optimal for the daughter languages anyway because they have many more “types” than the nomenclature provides for. For example, Sanskrit *n*-stems include barytones and oxytones, and in each of them the weak cases may have either suffixal zero grade (*dhámnā*, *bhūmnā*) or a fixed suffix vowel (*ásmanā*, *ātmánā*). Several other subtypes must be distinguished because of the allomorphy in case forms such as the genitive singular. The upshot is that one of the four types, the proterokinetic type, is inapplicable to the synchronic description of the daughter languages, that more than four types are needed for them anyway, and that a proper analysis must allow for partial cross-classification of accent and ablaut properties.

In order to avoid these issues, I will reserve terms like *hysterokinetic* for the theoretical classification of reconstructed Indo-European paradigms, and use only descriptive terms such as *barytone*, *mobile*, *ablauting* when describing actual accentual and ablaut behavior. I believe that by following this practice, Indo-Europeanists could make their work more accessible to interested non-specialists (philologists and theoretical linguists in particular), engage alternative proposals more easily, and have at their disposal a convenient terminology for formulating explicit hypotheses about the processes and stages by which the daughter languages’ accent and ablaut systems evolved.

3 Germanic evidence from Verner’s Law

Barber 1932 showed that a significant number of nominal stems of all classes have alternate forms with voicing of their stem-medial fricatives, sometimes even within the same language, more often in another. He took such VERNER DOUBLETs as evidence that Germanic, like Baltic and Slavic, originally had movable accent in all stem classes. Stang (1957, 1969), and independently Halle 1997), considered Germanic mobility of *o*-stems and *ā*-stems an IE inheritance, and their Greek-Sanskrit immobility a later development.

Another view (Kiparsky 1973: 845) is that the extended mobility arose separately within Germanic through two (possibly concurrent) innovations parallel to those of Balto-Slavic: (1) oxytones became movable by replacing central mobility (desinantal/predesinantal) by marginal mobility (word-initial/word-final), and (2) the mobility was extended to **o*- and **ā*-stems because their suffixes fused morphologically with the case endings. In that case, since at least the second of these changes is intrinsically unidirectional, the original scope of mobility must have been as in Greek and Sanskrit.

For Germanic, the compositional approach to accent, under either of the two historical scenarios, can be distinguished empirically in the following ways from the paradigmatic approach, and more specifically from the four-type system in (1).

First, the compositional analysis posits a distinction between barytone (root-accented) and oxytone (suffix-accented) stems in all noun classes, and claims that the oxytones became mobile in Germanic. In contrast, the paradigmatic analysis claims that some classes of stems, including all the feminine *i*-stems, were uniformly proterokinetic. Therefore the paradigmatic analysis predicts

Verner doublets for all those classes, whereas the compositional analysis predicts them only for their oxytone members.

Secondly, the compositional analysis predicts Verner doublets in original oxytones even of the mesostatic type, such as those in *a*- and *ō*-stems (IE **o*- and **ah₂*-stems), since it claims that these became mobile in Germanic. The paradigmatic analysis, in contrast, predicts that Verner doublets should be confined to items that were originally amphikinetic or proterokinetic.

Finally, the two analyses lead to different expectations about the distribution of fixed voiced and voiceless fricatives in stems. Both of course imply the existence of Verner doublets only within noun classes as a whole; most stems have generalized either the voiced or the voiceless consonant. Still, since the compositional account posits Germanic mobility in all oxytones, it entails that some of them might have stabilized the voiceless alternant. The paradigmatic account makes an analogous prediction for those stem types that it reconstructs with uniform proterokinesis, namely that they should contain items that have leveled out the alternation to either the voiced or the voiceless fricative.

Schaffner 2001 re-examined the entire Germanic material in an attempt to reconcile it with the four-type system in (1). His study provides ample data for comparing the compositional analysis with the paradigmatic analysis that it presupposes. This can be done most easily with the three largest nominal classes: *a*- and *ō*-stems, and feminine *i*-stems. For Verner doublets, by the reasoning just laid out the two crucial sets of cases are (1) oxytone *a*- and *ō*-stems, for which only the compositional analysis allows Verner doublets, since it claims that they became mobile in Germanic, and (2) barytone feminine *i*-stems, for which only the paradigmatic analysis allows Verner doublets, since it posits Indo-European proterokinetic mobility for them. Analogously, the compositional and paradigmatic theories predict a different distribution of “wrong” fricatives: lexicalization of the voiceless Verner alternant in (1) and lexicalization of the voiced Verner alternant in (2), respectively. For the remaining two cases, (3) barytone *o*- and *ā*-stems and (4) oxytone *i*-stems, the two theories converge, though by partly different paths. They agree that barytone *o*- and *ā*-stems should have no Verner doublets, since they were immobile to start with and never became mobile. They also agree that oxytone *i*-stems should have Verner doublets — the paradigmatic analysis on the grounds that they were proterokinetic, and the compositional analysis on the grounds that they became mobile in Germanic, like all oxytones.

To test these predictions I culled from Schaffner’s and Barber’s data those *o*-, *ā*-, and feminine *i*-stems whose original accentuation can be determined from exact cognates in Greek, Sanskrit, or Balto-Slavic (not just root etymologies), or which are formed with an IE suffix that has a known uniform accentuation. I sorted them into original barytones and oxytones, and examined the distribution of clues to former mobility in each group.

The results support the compositional account. Verner doublets are found not only in *i*- and *u*-stems, but also in *o*-stems and *ā*-stems, in great numbers. They are overwhelmingly concentrated in oxytones, in all stem types. Barytones, in contrast, generally have voiceless fricatives in the root, and this crucially even in *i*- and *u*-stems, belying the proterokinesis that the paradigmatic analysis maintains for that whole class. The cases of unexpected fixed voicing and voicelessness point in the same direction. Here are the data organized according to the above categories.

Verner doublets are frequent in all types of oxytone stems.

- (22) a. **rīxō*- ~ **rīzō*- ‘row’ (MHG *rīthe* vs. OHG *rīga*), **anþija*- ~ **anðija*- (OHG *endi*, ON *enni* ‘forehead’ vs. Gothic *andeis* OHG *enti* OE *ende*) **h₂antiós* (ἀντίος ‘opposite’ < **ἀντιός* by Wheeler’s Law).

- b. *gunþa-* ~ *gundā-* ‘boil, abscess’ (OHG *gund* vs. Gothic *gund* OE *gund*), **skaiþa-* ~ **skaiða-* ‘separation’ (OS (*gi-*)*skēþ*, (*gi-*)*skēth* vs. OHG (*gi*)*skeit*, OE (*ge*)*sc(e)ād*), *falþa-* ~ *falða-* ‘fold’ (OHG *fald* vs. ON *-faldr*) and ‘-fold’ (Gothic *-falþs* vs. OHG *falt*), *xluþa-* ~ *xluða-* ‘famous’ (in PN. *Clotharius*, OE *Hlophere* vs. *Chlodomeris*, *Chlothomerus*, *Hloderic* etc.), **balþa-* ~ **balða-* ‘bold’ (ON *ballr*, Gothic *balþs*, OHG *bald* vs. ON *baldr*, Schaffner 280), **-werþa-* ~ **-werða-* (ifc.) ‘turned’ (Gothic *wiprawairþs* vs. OHG *-wert*), Skt. *vi-vartā-*. IE **-tó-* (result nominalizer and participle), e.g. *klu-tó-* (Skt. *śrutā-*, *κλυτός*).
- c. **axila-* ~ **ažila-* ‘ear (of corn), awn’ (OHG *ahil* vs. OE *egl(e)*), **anxula-* ~ **anzula-* (OH *áll*, *óll* ‘sprout’ vs. OE *angel*, *angul*, *ongel* ‘fishhook’, ON *ǫngull* ‘fishing rod’), **axwala-* ~ **ažwala-* ‘fork’ (ON *soð-áll* vs. OE *awel*, *awul*), **xufila-* ~ **xubila-* ‘hill’ (OHG *huvel* vs. MHG *hubel*), **xurþila-* ~ **xurðila-* ‘hurdle’ (OE *hyrþil* vs. *hyrdel*), **tuxila-* ~ **tužila-* ‘rein, strap’ (ON *tygill* vs. OHG *zugil*), **x^wex^wla-* ~ **x^wež(u)^wla-* ‘wheel’ (OE *hweohl* vs. *hweog(u)l*, *hweowol*), Skt. *cakrá-* (but Gk. *κύκλος*), **prēxila-* (**praxila-*) ~ **prežila-* ‘servant, slave’ (ON *þráll* vs. OHG *drigil*). Also feminine **-lā*, **þwaxilō-* ~ **þwazilō-*, **þwazilo-* ‘washtowel’ (OHG *dwehila* vs. MLG *dweil(e)*, ON *þvegill*), Schaffner 412. IE oxytone **-ló-*, Wackernagel-Debrunner 1954: 849 ff., Probert 2006: 160, Ch. 10).
- d. **baruxa-* ~ **baruža-* ‘barrow, castrated pig’ (OHG *barug*, ON *þorgr* vs. OHG *paruch*), **xaruxa-* ~ **xaruža-* (OE *hēarg*, *hearg*, Mercian *herg* ‘sacred grove’, ON *hǫrgr* ‘altar’ vs. OHG *haruch* ‘grove’, **dūšixa-* ~ **dūšizā-* ‘stupid, dizzy’ (OE *dysig*, OHG *tusig*) vs. OWFris. *durich*), **xafīžā-* ~ **xabīžā-* ‘heavy’ (OHG *hebig* vs. *hevig*), **skelxa-* ~ **skelžā-* ‘slant, squinting’ (OE *scēolh*, OHG *skelah* vs. OH *skialgr*), **pelxa-* ~ **pelžā-* ‘stubborn’ (ON *úþiall* vs. *úþialgr*). IE oxytone **-kó-*, Wackernagel-Debrunner 1954: 515 ff.
- e. **laisista-* ~ **laizista-* ‘least’ (OE *lāest*, *lārest*) **lois-is-tó-*, **wersista-* ~ **werzista-* ‘worst’ (OS. *wirsisto*, OE. *werresta*) **wers-is-tó-*, **xanxista-* ~ **xanzista-* ‘stallion’ (ON *hestr*, OHG *hengist*, OE *hengest*), an old oxytone superlative **kank-is-tó-* ‘fastest’ (Schaffner 133). Although superlatives usually have root accent in Greek and Sanskrit, they appear to have been originally oxytone (Wackernagel-Debrunner 1954: 459 ff., Schaffner 349), and all the Germanic forms can be derived from oxytones. (Note that the samprasāraṇa in **-yos-* > **-is-* requires accented *-tó-*.)
- f. **alþra-* ~ **alðra-* ‘age’ (Gothic *framaldrs* ‘aged’, ON *aldr* vs. OHG *altar*), **kurþra-* ~ **kurðra-* ‘collection, herd’ (OE *corþor* vs. OHG *kortar*). IE nominalizer **-tró-*.
- g. **frōþa-* ~ **frōða-* ‘wise’ (Gothic *unfrōþans* ~ *unfrōðans* (Schaffner 290), OE *frōð*, OHG *fruot*), **faixa-* ~ **faižā-* ‘colorful’ (Goth *filufaihs*, OE *fāg*, Schaffner 288). These are thematic adjectives to barytone nouns (Lith. *prōtas*, Skt. *pésā-*), oxytone by internal derivation (as discussed below).
- h. **(ga)burþi-* ~ **(ga)burði-* ‘birth’ (Gothic *gabaúrþs*, ON *burðr*, OHG (*gi*)*burt*), *bhr-tí-* (RV *bhr-tí-*, later Skt. *bhṛīti-*), **(ga)kunþi-* ~ **(ga)kunði-* ‘kin’ (Gothic *gakunþ-* vs. OHG *gikunt*, OE *gecynd*), **gṇh₁-tí-* (Skt. *jāti-*), Schaffner 454. The suffix *-tí-* was originally mostly oxytone.³⁵

³⁵Schaffner claims (p. 439) that Vedic alternations like RV *bhṛtí-*, *matí-*, ŚB *bhṛīti-*, *māti*) testify to former proterokinesis. More likely, the Vedic accentual variation rather reflects an ongoing shift of *-ti-* nouns from oxytone to barytone accentuation (Wackernagel-Debrunner (1954: 631-2): in RV they are predominantly oxytone, later Vedic

- i. Nominalizer **-ō-pu- ~ -ō-ðu-* (Gothic *gaunōþus* ‘sorrow’ vs. *auhjōdus* ‘noise’, OHG *arnōt* ‘harvest’, *klagōt* ‘lament’ vs. *wagōd* ‘motion’, *wegōd* ‘help’), IE **-ā-tú-* (βοητύς ‘cry’).

The crucial cases are the *o-* and *ā-*stems (22a-g), which tell against the paradigmatic analysis.³⁶

Conversely, the paradigmatic analysis allows Verner doublets in barytone feminine *i-* stems, because it attributes IE proterokinetic mobility to them. But no such doublets exist. Barytone *i-*stems have regularly voiceless fricatives: **mæpi-* ‘measure’ (OE *mæð*), **meh₁-ti-* (μῆτις ‘trick’), **wipi-* ‘withe’ (Lith. *výtis* ‘willow switch’), **nasi-* ‘nose’ (OE *næs-*), Lith. *nósis*. This again supports the compositional analysis.

Problematic for both theories, however, are the Verner doublets in *a-*stems, comprising the isolated case (23a), and a whole group of instrumental/locative nouns in **-tlo-* (23b).

- (23) a. **aþuxa- ~ *aþuza-* ‘backwards, inside out’ (OHG *abuh* Adv. *aboho* vs. ON *ófugr*, Lloyd & Springer 1988: 34). Locative *-ka* is normally recessive in Sanskrit.
 b. **bīþla- ~ *biðla- > *billa-* ‘axe’ (ON *bíldr* OHG *bíhal* vs. OE *bill*), **maþla- ~ *maðla- > *malla-* ‘meeting (place), speech’ (Gothic *maþl*, OHG *mahal*, OE *mædel* vs. OSw *mall*), **kiþla- ~ *kiðla-* ‘wedge’ (MHG *kīdel* vs. OHG *kīl* OSw *-kill*), **nēþlō- ~ *nēðlō-* ‘needle’ (Goth. *nēþla* ON *nál* OHG *nādala* vs. OE *nædl*, Ringe 2006: 271), **staþla- ~ *staðla- > *stalla-* ‘stand, place’ (OHG *stadal* vs. *stal*, Dat. *stalle*, OE *stēal(l)*) **sth₂-tlō*.³⁷

In (23a) there is some evidence for barytone/oxytone alternation *ápāka-* ‘backward’, adverbial Instr. *apākā*, ‘behind’, Abl. *apākāt* ‘from behind’, but the Germanic forms are difficult, and OHG *aboh* would require accent on the second syllable, for which there is no evidence.³⁸

The difficulty with (23b) is that instrumental/locative nouns in **-tlo-* were barytone in Indo-European (Schaffner 177, Wackernagel-Debrunner 1954: 701), e.g. *póh₃-tlo-* (Skt. *pātra-* ‘bowl’ Lat. *pōculum*), **génh₃-tlo-*, **gnóh₃-tlo-* (Skt. *jñātra-* ‘mental faculty’, Lith. *žénklas* ‘mark, sign’).

shows lexical diffusion of initial accent, which finally becomes the norm (Pāṇini 3.3.94; Vedic oxytones are listed as exceptions in 3.3.96-97). It is significant that when both accentual variants are chronologically differentiated in the texts, the barytone variant is the later one.

³⁶For most of them, as well as for (23a), Schaffner appeals to *Suffixtausch* as a kind of magic wand. For ‘wheel’, he envisages an alternation between a barytone singulative **k^wék^wlō-s* ‘wheel’ and a derived oxytone collective **k^we^klā-h₂* ‘set of wheels, chariot’ (with an anaptyctic ‘e’ to ease the triconsonantal cluster), on the pattern of **wérðho-m* : **wrdhá-h₂* ‘word’ → ‘speech’. The derivation itself is convincing, but the accentual opposition that is doing the work (summarized in Schaffner 107 ff.) rests on shaky evidence, and it runs counter to clear cases such as μῆρός ‘thigh’, μῆρα (μῆρα) ‘thigh-bones, ham’, ἄχος ‘high’, ἄχη ‘summit, heights’ (Vine 2002: 334), which point rather to root-accented collectives.

³⁷Maybe also **buþla- ~ *buðla- > *bulla-* ‘dwelling’, though the voiced alternant is doubtful (Schaffner 122), and **fōþra- ~ *fōðra-* ‘load’, ‘sheath’, which however look to be distinct words (OHG *fuodar* and *fuotar*, Schaffner 196).

³⁸This particular IE suffix **-ko-* seems to be a composite, built by adding *-a* to the weak form of the suffix in *pratyāñc-*, *pratic-* ‘forward’, *ápāñc-*, *ápāc-* ‘backward’, which productively makes adjectives from directional adverbs in Vedic. Apparently the bleached second member of a compound, it seems to alternate between **-henk^w-* in the strong cases and **-hk^w-* in the weak cases (the latter perhaps also in Gothic *ibuks* ‘turned backwards’, with *-u-* due to the labiovelar, as in *-uh* < **-k^we* ‘and’). A derivative **ápo-hk^w-o- ~ *apo-hk^w-ó-* is seen in *ápāka-* ‘backward’, Instr. *apākā* ‘behind’, Abl. *apākāt* ‘from behind’. These would give Germanic **afōz-*, **abōz*, which would both give Swedish *avog* [a:vu:g] ‘averse’ (note the long vowel in the second syllable). More difficult is the related Swedish word *avig* ‘reverse’ (side, page), which matches ON *ófugr* (< **áfuzā- < *áp-hk^w-o-*?) The *-k* of English *awkward*, dial. *awk* (< OE **afoc*) is also awkward.

The behavior in (23b) seems to be shared by the whole class **-tlo-* formations, so the suffix itself apparently became oxytone in Germanic, possibly by analogy to the originally oxytone nominalizing suffix **-tró-* (see (22f) above). Alternatively, we might appeal with Schaffner 123, 145, 160, 178, 182, 246) to the singulative/collective alternation, although the cognates offer no independent support for collective morphology, the semantics is rather sketchy since such things as axes and wedges weren't particularly likely to come in sets, and it doesn't tell us why *-tlo* nouns were affected *en masse*. To repeat: the cases in (23) require an explanation in both theories; exceptions involving *i*-stems, which would positively support the paradigmatic analysis, are not found.

A further prediction of the compositional analysis is that former oxytone *a-* and *ō-*stems can have voiceless stem consonants Germanic, through generalization of the voiceless Verner alternant from the strong cases. There is a robust group of such cases, all inconsistent with the paradigmatic analysis.³⁹

- (24) a. **lauxa* 'lea' (OE *lēah*, OHG *lōh*) **loukós* (Skt. *lokáḥ*), **lauþra-* 'lather' (ON *lauðr*, OE *lēaðor*) λουτρόν 'bath'.
- b. **anxulō* 'leather strap' (ON *ál*, *ól*, OE *ōl(-þwang)*) **h₂anku-la-h₂* (ἀγκύλη < *ἀγκυλή 'loop, noose'). IE accented **-ló-* (see (22c)).
- c. **blauþa-* 'weak' (OE *blēað*, ON *blauðr*), **blīþa-* 'blithe' (ON *blīðr*, Gothic *bleiþs*), **xalþa-* 'inclined' (ON *hallr*, OHG *hald*), **xulþa-* 'dear' (ON *hollr*, OHG *hold*), **laiþa-* 'loth' (OE *lāð*, OHG *leid*, Sw. *led*), **kunþa-* 'known' (Gothic *kunþs*, ON *kunnr*, OE *cūþ*, OHG *kund*). All with IE accented **-tó-*, e.g. **ǵnh₃-tó-* Skt. *jātá-*, γνωτό-

The appearance of voiceless fricatives before originally accented syllables in so many oxytone words is good evidence that this accentual type was mobile in Germanic.

Conversely, the paradigmatic analysis expects some barytone feminine *i-* stems to have voiced fricatives, for if they were proterokinetic, they would have had Verner doublets, and some of these ought to have been leveled out in favor of the voiced alternant. However, no such cases are attested, which is as it should be on the compositional analysis.

Unsurprisingly, the great majority of barytones of all types have voiceless fricatives.⁴⁰

³⁹If the assumption made at (23b) is right, then another example is **ǵénh₃-tlo*, **ǵnóh₃-tlo-* (Skt. *jñātra-* 'recognition', Lith. *žénklas*), Gmc. **knōþla-* OHG *einknuodili* 'insigne', Lloyd-Lühr-Springer 1998: 1005). Unsurprising for both analyses are the many oxytones with fixed voiced fricatives, such as **frīða-* (ON *frīðr* 'beautiful' OE *frīðhengest* 'fine horse') **prih-tó-* (Skt. *prīṭá-* 'friendly') and several other adjectives in **-tó-*, nouns with the same suffix such as *guða-* 'god' (OHG *got*) **ghu-to-* (Skt. *hutá-* 'oblation, one to whom an oblation is offered'), **turða-* 'turd' IE **drtó-*, **memzo-* 'meat' (Goth. *mimz*) Skt. *māmsá-*, **maþra-* 'lean' (OHG *magar*) **makró-* (μακρός 'long', Lat. *macer* 'slender'), **sweþru-* 'mother-in-law' (OHG *swigur*) **swekrú-* (Skt. *śvaśrū*), **zarða-* 'yard, enclosure' (Gothic *gards*, ON *garðr*) **ghordhós* (Skt. *grhá-*, OCS *gradŭ*).

⁴⁰I provide only a selection of barytones: **gulþa-* 'gold' (Gothic *gulþ*, ON *gull*) **ghl̥h-to-*, **exwa-* 'horse' (Goth. *aihwatundi*) **ékwos*, **swexura* 'father-in-law' (OE *swehor*) **swékuros* (Skt. *śváśura-*), **flaþara-* (πλάτανος), **mūþra-* (Dutch *modder* 'mud', G. *Moder* 'mold' (Skt. *mūtra-* 'urine'), **xufra-* Lith. *kuprà*, **xleuþra-* 'hearing' **k̥leutrom* (Skt. *śrótram* 'ear'), **xliþa-* 'slope' **k̥litos* (κλίτος), **wulfa-* 'wolf' *wl̥k^wos* (Skt. *v̥lka-*), **amsa-* 'ridge' (Gothic *ams*, ON *āss*) **ómsos* (Skt. *āmsa-*, ὄμος 'shoulder'), **arsa-* 'arse' **órsos* (ὄρσος), *-iþa* (OHG *-ida*), **-é-tā* (*puruśá-tā*), **táxru-* 'tear' (OHG *zahar*), **dakru-* (Skt. *ásru-*, δάκρυ) **fexu-* 'cattle, fee' (Gothic *faihu*, OHG *fihu*) **peku* (Skt. *pásu*). There are nevertheless some *a-*stems with barytone cognates but voiced stem fricatives, another headache for *both* theories: **þezna-* 'thane' (ON *þégn*, OHG *degan*), vs. τέκνον, **sweþna-* (ON *swefn*) vs. Skt. *śváþna-*, ὕπνος, and perhaps **aþna-* 'bait' (ON *agn*) vs. Skt. *ásanam* 'food'.

I interpret these findings as evidence that even thematic oxytones were once mobile in Germanic, and that feminine *i*-stems included a class of immovable barytones. On both counts, this supports the compositional analysis over the paradigmatic analysis.

4 Internal derivation

4.1 Internal derivation is deaccentuation

The Indo-Europeanist literature distinguishes *internal derivation*, marked only by a change in accent/ablaut type, and *external derivation*, marked by an overt derivational suffix.⁴¹

In the compositional model, internal derivation can be treated as the affixation of derivational morphemes that have no phonemic content, but otherwise have the properties of overt derivational morphemes: accentual features, grammatical features such as gender, semantic features such as ‘instrument’ or ‘location’, and the power to modify the argument structure and/or aspectual properties of their bases.

If they are indeed full-fledged morphemes, then they should have the same kinds of effects on the accent and ablaut of their bases that overt derivational morphemes have.

What are these effects? Most external derivational suffixes impose their accent pattern not only on unaccented stems, but also on accented stems; they are DOMINANT, as opposed to all inflectional suffixes, and to a small number of very productive derivational suffixes, such as **-went-* (Skt. *-mant-*, *-vant-*), which are RECESSIVE (see 4.2 below). Internal derivational suffixes are therefore expected to be dominant. (If they weren’t, they would be phonologically undetectable, “absolute zero” affixes). Moreover, since they have no segmental content, let alone a vocalic nucleus, they can’t be accented. Internal derivation, then, is the addition of a dominant unaccented suffix. The phonological effect of such a suffix is to erase the accent of its base. This amounts to converting accented monosyllables into movable ones, and (due to the Oxytone Rule) to converting barytone (inherently accented) polysyllables into oxytone ones.

Does this theoretical expectation match the data? Four processes of internal derivation are standardly recognized (Fortson IV 2004: 110):

- (25) a. Proterokinetic → amphikinetic.
- b. Acrostatic → proterokinetic.
- c. Acrostatic → amphikinetic.
- d. Proterokinetic → hystero-kinetic.

An example of internal derivation of type (25a) is Skt. *bráhman-* (n.) ‘sacred formulation’ → *brahmán-* (m.) ‘priest’. The weak cases are identical apart from accent (e.g. Gen.Sg. *bráhman-as* and *brahmán-as*), and in the nominative and accusative it follows the respective rules for neuters and non-neuters (Nom-Acc.Pl. *bráhmāṇ-i* vs. Nom.Pl. *brahmāṇ-as*, Acc.Pl. *brahmán-as*). The lengthening by (14) in the strong cases reveals *o*-grade, presumably conditioned by the deaccentuation, perhaps by the same rule that yields *o*-grade in deaccented second members of compounds mentioned at the end of this section. The base *bráhman-* (IE **bhlégh-men-*) is inherently accented on the first syllable. The derived stem loses its inherent accent, and then gets stem-final accent by the Oxytone Rule (5): *bráhman-* → (deaccentuation) *brahman-* → *brahmán-* (IE **bhlégh-men-*

⁴¹Thanks to Brent Vine for stressing the importance of internal derivation for the proper analysis of accentuation (*voce et in litt.*).

→ **bhleǵh-món-*). Contrary to the paradigmatic analysis, which assumes that the derived stem is amphikinetic, (Nom.Sg. **bhléǵh-mon-es*, Gen.Sg. **bhlǵh-mn-és* as per (1)), the reconstruction in section 2.2 assumes that it is unaccented and receives a default accent on the stem-final syllable by the Oxytone Rule (5): **bhleǵh-món-es*, **bhleǵh-mén-ós* > **bhleǵhménos*. Secondary mobility does not arise because the consonant cluster prevents deletion of the stem-final vowel (***bhleǵhmnós*, ***brahmṇás*).

Internal derivation of type (25b) is just the same deaccentuation process, this time applying in *i-,u-*stems, with default oxytone by (5), though the paradigmatic analysis makes it *seems* different from type (25a). A good example is Sanskrit *āyu-* ‘life’, *āyú-* ‘living being’ (Wackernagel-Debrunner 1954: 475-6). The derivation converts a barytone stem into an oxytone stem with the same inflection. The base *āyu-* (**h₂óyu-*) does not have the acrostatic inflection, nor does the derivative *āyú-* have the proterokinetic inflection, as these are defined in (1). Both conform to the paradigm *sūnú-* in (15), consistent with our view that barytone and oxytone stems inflect alike, as argued for *i-,u-*stems in section 2.4.

The proposed account does not predict concomitant ablaut effects for internal derivation, but it is consistent with them. The question is whether the Oxytone Rule feeds zero grade ablaut. In *āyú-* and *brahmán-* it clearly doesn’t (**iyú-*, *brhmán-*), but a possible case is Greek *κρατύς* ‘strong’ (**krtús*), if internally derived from a Greek counterpart of Sanskrit *krátu*, *krátve*, *krátvā*, Avestan *xratu*, *xraθβe*, *xraθβā* ‘insight, intelligence’, as commonly assumed.

According to Schindler (1975a) internal derivation of type (25c) is represented by the Hittite derivation Nom.Sg. *wātar*, Gen.Sg. *wedenas*, Instr.Sg. *wedand(a)* (IE **wód-r-*, **wéd-n-*) → plural *widār* ‘waters’ (Skt. *udnás*), IE **wed-ór*, **ud-n-és*. This is actually not a case of type (25c), for the derived noun is not accentually amphikinetic, but hysterokinetic (section 2.5), an oxytone heteroclit with secondary mobility in the sense of section 2.2. I conclude that the phonological effect of internal derivation of type (25c) is deaccentuation with default oxytonesis by (5).

Widmer states that the only somewhat likely example of type (25c) is **rēǵ-r-/-n-* (Av. *rāzarē*, *rāzəṅg* ‘power, (religious) verdict’) → **rēǵ-on- reǵ-n-’* (Skt. *rājan-* Acc.Sg. *rājānam*, Gen.Sg. *rājñah* ‘king’). This derivation actually changes the morphology of the stem, replacing *-(o)r-* by *-(o)n-* in the strong cases, so it is not clear why it should be considered a case of “internal derivation”. The obvious alternative is that both *rājan-* and *rāzarē*, *rāzəṅg* are externally derived with different suffixes, from the root, or from the root noun **rēǵ-* (Latin *rēx*, *rēg-*, Skt. *rāj-*).⁴²

As a parallel case, Johnsen (2005: 253) proposes **h₃óp-r-*, **h₃ép-n-* ‘wealth’ (Hitt. *happar* ‘trade, payment’) → **h₃ép-on-*, **h₃ep-n-’* ‘having wealth’ (Gmc. **áfan-/abn-* ‘pater familias’, Gothic *aba* ‘male, husband’, Sg. *aban*, *abin*, *abins*, Pl. *abans*, *abne*, *abnam*). The hypothesis of internal derivation, however, can be discarded without detriment to Johnsen’s explanation of the Gothic word’s inflection; both lexemes, **h₃óp-r-* and **h₃ép-on-*, can be externally derived with different suffixes from the root, or from the root noun **h₃óp-* (Latin *op-*).

Type (25d) is abundant and corresponds to a long-recognized derivational process. Examples would be Vedic *ápas* (n.) ‘work’, *apás-* ‘working’ (Widmer 2004: 65), *yásas* (n.) ‘splendor’, *yaśás-* ‘splendid’, *éṣa-* ‘hurry’, *eṣá-* ‘hurrying’, Greek *ψεῦδος* ‘lie’, *ψευδής* ‘liar’, *τόμος* ‘cut’, *τομός* ‘cutting’, *φόρος* ‘burden’, *φορός* ‘bearer’. Again (still assuming the agent/process nouns are derived from the result/state nouns) the bases are accented on the first syllable, and the derivatives

⁴²Note also that if a noun such as *rājan-* is and always was acrostatic (as I suggested in section 2), then it couldn’t in any case be “internally derived”, since its putative base is itself acrostatic.

are deaccented, and receive default stem-final accent by (5), as before. There is no evidence of accentual hysterokinesis.⁴³

Thus, if the analysis of accentuation I propose in section 2 is correct, then all four types of internal derivation involve erasure of inherent stem accent, which in case (26c) automatically entails secondary mobility. The patterns of (1) do not appear. Internal derivation, then, turns out to fit into a type of deaccenting zero derivation seen also in some bahuvrīhi compounds formed without an overt compositional suffix, such as *abhrātār-* ‘having no brother’ (from *bhrātār-*), though judging from RV 4.5.5 Nom.Pl. *abhrātārah* with no ablaut effects.

- (26) a. **bhlégh-men-* → **bhlegh-men-* (→ **bhlegh-món-*)
 b. **h₂óyu-* → **h₂oyu-* (→ **h₂oyú-*)
 c. **uód-or-* → **uod-or-* → **wed-ór-*
 d. **bhór-o-* → **bhor-o-* (→ **bhor-ó-*)
 e. **bhráh₂-ter-* → **ṅ-bhrah₂-ter-* (→ **ṅ-bhrah₂-tér-*)

In sum, the compositional analysis makes it possible to subsume the distinct derivational processes in (25) under a single unified process of accent deletion, which applies also in a class of compounds with a similar function, and which we know is triggered by the vast majority of overt derivational suffixes as well.

Widmer (2004: 67, 70) proposes an additional type of internal derivation, hysterokinetic → amphikinetic. Together with (25a,c), this amounts to making the amphikinetic type a catch-all class on which internal derivation from all other three types converges. If this fifth type did exist, it would refute our generalization, because it could not be folded in with the other four as a deaccentuation process. That would in turn undermine the argument for the compositional analysis to the extent that it is based on internal derivation.

Tellingly, this type is quite different in character from the four standardly recognized ones in (25). It is *only* manifested in *e/o* ablaut, and violates the accent patterns in (1), even in IE, on any plausible reconstruction. Widmer posits it only for compounds, citing the bahuvrīhi type *tvátpitar-*, *tvátpitārah* ‘having you as a father’ and εὐπάτωρ ‘having a good father’. These compounds don’t have an amphikinetic accent pattern (it’s not clear what it would be for compounds anyway) their only claim to amphikinesis is the *o*-grade in *-tor-* (overt in Greek and manifested by Brugmann’s Law in Sanskrit). Their ablaut otherwise adheres to the general rules for *o*-grade sonorant stems in the respective languages, e.g. εὐπάτωρ εὐπάτορος like ῥήτωρ ῥήτορος (not amphikinetic zero grade **εὐπάτρος*), and *dákṣapitārah* *-pitṛn* ‘having Dakṣa as a father’ like *hotārah* *hotṛn* ‘priests’.⁴⁴ In short, rather than derived amphikinesis, they seem to have the *o*-grade seen in other compound stems, especially in bahuvrīhis, as in κέλευθος → ἀκόλουθος ‘follower’, εὐφρων ‘happy’, Nom.Pl. *óhabrahmāṇah* ‘conveying sacred knowledge’, *viśvāsārada* ‘annual’, *extorris* ‘exile’, *meditullium* ‘inland’. Therefore our generalization remains viable.

I conclude that internal derivation converts barytone stems to oxytone stems, in an operation which the compositional analysis reduces to two general processes that apply widely throughout the system: derivational deaccentuation plus the Oxytone Rule.

⁴³However, if *-as-* was unaccentable at an earlier stage (as discussed in section 2.5; then (5) would not apply and the result would have been an amphikinetic paradigm analogous to that of *uśas-*.

⁴⁴While the type is regular in Greek, (φιλομήτωρ, εὐήνωρ etc.), in Vedic the second member often remains unmodified: *dákṣapitārah*, *-ā* ~ *dákṣapitārah*, *-ā* (Wackernagel-Debrunner 1957: 32.)

4.2 External derivation

Overt derivational suffixes, like inflectional suffixes, may be accented or unaccented. This is entirely unpredictable from their phonological shape. Consider the two varieties of the agent suffix *-tar*. One forms agent nominals with accusative objects, from underived verb roots only, and is unaccented. The other forms agent nominals with genitive objects, goes freely on causatives and other derived verbs, and forms secondarily mobile oxytones, e.g. *codayitrī́* ‘impeller’ (from caus. *codáyati*), Gen.Pl. *unnetīṅṅām* ‘priests.’

An example of an accented dominant suffix is the noun-forming suffix *ín*, which invariably yields immobile stems (e.g. Instr.Sg. *rathín-ā*).

- (27) *rátha* ‘chariot’ *rathín* ‘charioteer’
mitrá ‘friend’ *mitrín* ‘befriended’

An example of a dominant unaccented (=preaccenting) suffix is */-ta/ (-tā)*, which forms abstract nouns:⁴⁵

- (28) *púruṣa* ‘human being’ *puruṣátā* ‘human nature’
mitrá ‘friend’ *mitrátā* ‘friendship’

Thus, dominant suffixes can be assigned the same accentual properties as the corresponding recessive suffixes, except that they neutralize lexically specified accent.

- (29) Dominant suffixes (both accented and preaccenting=unaccented) erase the inherent accent of the stem to which they are added.

Dominance appears to be almost entirely unpredictable from segmental or other characteristics. Still, it is far from arbitrary. The following generalization holds for both accented and unaccented suffixes in Vedic.

- (30) Dominant suffixes may precede but never follow recessive suffixes.

Many such sequences are trivially excluded because most recessive suffixes are inflectional. But the generalization appears hold even for *derivational* recessive suffixes. Vedic has no such words as **paśumattvám*, **akṣanvátā*, containing combinations of recessive suffixes (here *-mánt/vánt*) followed by dominant suffixes (here *-tvá*, *-tā*). Similarly, level 1 denominal suffixes do not attach to the recessive *-ī* suffix: there is no **devítā* to go with *devátā*. However, recessive denominal suffixes do, e.g. RV. *śiprinívant-* ‘mustached’, *sarasvatívant-* ‘accompanied by Sarasvatī’.

In the framework of Lexical Phonology, such a correlation between word structure and morphophonology is indicative of level-ordering. For Vedic we can postulate two levels of suffixation, on the basis of converging morphological and phonological criteria. Level 1 contains all the dominant suffixes, including the initial-accenting ones, while level 2 contains all the recessive suffixes. The fact that dominant suffixes come before recessive suffixes in the morpheme order comes from the precedence of level 1 affixation over level 2 affixation, and the accentual differences between them are accounted for by restricting Accent Deletion to level 1.

In Greek, Steriade 1988 proposes that *all* derivational suffixes are dominant; see Probert 2006 for a synchronic and diachronic treatment of derivational suffixation in Greek.

⁴⁵I take the suffix to be */-ta/* (P. 5.1.119 *taL*), as in βίωτος and OCS *životŭ*, plus the feminine *-ā* characteristic of abstract nouns, as in Latin *vīta* ‘life’ (Meillet 1965: 354). The bare *-ta* appears in compounds (see (38) below), and many RV occurrences of *devátā* must be construed as Instr.Sg. of *deváta-*.

- (31) a. Dominant accented: ἵππος ‘horse’, ἵππεύς ‘horseman’, πορθμός ‘ferry’, πορθμεύς ‘ferryman’, πορθμευτικός ‘relating to (or working as) a ferryman’
 b. Dominant unaccented (induce recessive accent, corresponding to the BAP): βασιλεύς ‘king’ → βασίλεια ‘queen’

A further point worth mentioning is that oxytone sonorant stems can be underlyingly unaccented comes from derivatives with the possessive suffix *-vánt-*, *-mánt-* ‘having —’.

(32)	<i>pitár</i>	‘father’	<i>pitṛmánt-</i>
	<i>paśú</i>	‘cattle’	<i>paśumánt-</i>
	<i>rayí</i>	‘wealth’	<i>rayimánt-</i>
	<i>agní</i>	‘fire’	<i>agnimánt-</i>
	<i>arcí</i>	‘ray’	<i>arcimánt-</i>
	<i>aṃśú</i>	‘soma plant’	<i>aṃśumánt-</i>
	<i>āśú-</i>	‘speedy’	<i>āśumánt-</i>
	<i>ātmán-</i>	‘soul’	<i>ātmanvánt-</i>
	<i>akṣán-</i>	‘eye’	<i>akṣanvánt-</i>
	<i>asthán-</i>	‘bone’	<i>asthanvánt-</i>
	<i>dant-</i>	‘tooth’	<i>datvánt-</i>
	<i>pad-</i>	‘foot’	<i>padvánt-</i>
	<i>dyu-</i>	‘sky’	<i>dyumánt-</i>

The suffix *-mánt-*, *-vánt-* is accented, as shown by its fixed columnar accent throughout the declension, and it is recessive, since it yields to the accent of the stem, e.g. *taviṣ-mant-*, *prajā-vant-*, *mádhu-mant-*, *rátha-vant-*, *gó-mant-*, not **taviṣ-mánt-* etc. If we assume that oxytones are unaccented, and that the Oxytone Rule only applies to *inflectional* stems, nothing further needs to be said about the apparent accent shift in (32). The derivation is straightforward: /pitar-mánt/ → *pitṛmánt*, /paśu-mánt-/ → *paśumánt-*, /pad-vánt-/ → *padvánt-*.

5 Compounds

The main regularities that govern the accentuation of compounds follow from the BAP with no further stipulation.

Bahuvrīhi compounds accent the *first* member on its inherently accented syllable (Wackernagel 1905:291), a direct consequence of the BAP.

- (33) *sahásra-dákṣiṇa* → *sahásradakṣiṇa* ‘having a fee of a thousand (cows)’
parjánya-rétas → *parjányaretas* ‘from Parjanya’s seed’
gó-vápus → *gónapus* ‘having the form of a cow’
éka-śitipád → *ékaśitipad* ‘having one white foot’
 ἄελλόπους ‘wind-footed’
 ὠκύπτερος ‘swift-winged’
 ἄργικέραυνος ‘with brilliant lightning’
 κλυτόπωλος ‘with noble steeds’ (Vendryes 1945: 196)

After oxytone stems ending in *i*, *u*, and *r*, the *second* member is usually accented on its inherently accented syllable (Wackernagel 1905, 296).

- (34) *dvidhára* ‘forming two streams’
trimūrdhán ‘three-headed’
pururúpa ‘many-formed’
śitipṛṣṭhá ‘white-backed’
bahuprajá ‘having many offspring’
kṛdhukárṇa ‘short-eared’
urucákṣas ‘far-sighted’
pṛthupákṣas ‘broad-flanked’
āśuhéṣas ‘having quick missiles’
trṣucyávas ‘having quick movements’
vibhukrátu ‘having superior strength’
nṛcákṣas ‘seeing men’ (‘man-sighted’)

Assuming as before that these oxytones are unaccented, the accent of these compounds follows directly from the BAP.

Dominant compositional suffixes impose their accent on the compound, as expected.

- (35) *agniretasá* ‘coming from Agni’s seed’ (*rétas*) (cf. *parjányaretas* ‘coming from Parjanya’s seed’)
urūṇasá ‘broadnosed’ (cf. *ṣṣūnas* ‘straight-nosed’)
śitikaksín ‘white-bellied’ (*śitikákṣa* ‘id.’)
sūryadevatyà ‘having the sun as deity’ (cf. *ādityádevata* ‘id.’)

As already noted, if neither member of the compound has an inherent accent, the final accent assigned by the Oxytone Rule shows up.

- (36) *dvipád* ‘biped’ (instr.sg. *dvipádā*), *śitipád* ‘white-footed’, *tri-ṣṣúbh-*

The Oxytone Rule also assigns default final accent to a class of deaccented compounds; we may think of them as having a dominant zero compositional suffix.

- (37) a. *abhrātár* ‘having no brother’ (*bhrátar*)
abandhú ‘having no relatives’ (*bándhu*)
aphalá ‘fruitless’ (*phála*)
anenás ‘faultless’ (*énas*)
 b. *tribandhú* ‘having three relations’ (*bándhu*)
trivandhurá ‘three-seated’ (*vandhúra*)
tripastyá ‘three-housed’ (*pastyà* = *pastía*)
tryanīká ‘three-faced’ (*ánīka*)

A dominant suffix determines the accent of its stem. It erases any accent on the stem to which it is added (crucially, not on the whole word of which it is a part).

- (38) a. [[á [pra [jás]]] -ta-] *aprajástā* ‘lack of progeny’ (*áprajas* ‘lacking progeny’)
 • preaccenting *-ta* has scope over (C-commands) the whole compound.

- b. [[áditya] [[devá] -ta-]] *ādityádevata* ‘having the sun as deity’
 (*āditya* ‘sun’, *devá-tā* ‘deity’, *devá* ‘god’)
- preaccenting *-ta* has scope over the second member.

Similarly, the scope of *-tár* includes the prefix:

- (39) a. *prá-bhar-tr̥-* (recessive *-tar*)
 b. *upa-śro-tf̥-* (dominant *-tar*)

In determinative (*tatpuruṣa*) compounds with an adjectival head, the first member is accented by the BAP (Wackernagel 1905: 214, 238, 264). In Greek, the corresponding class of compounds has recessive accent (Vendryes 189).

- (40) *sarvá-rohita* ‘completely red’
túlya-śveta ‘equally white’
máde-raghu ‘quick in intoxication’
sarvá-śuddhava ‘completely white-tailed’
sāmantá-śitibāhu ‘having a white front paw on either side’
 παν-άγαθος ‘very good’ (ἀγαθός ‘good’)
 πρό-πᾶς ‘all together’

In determinative compounds with a nominal head, the same rule originally applied.

- (41) *grhá-pati-* ‘householder’
vāja-pati- ‘lord of booty’
prajā-pati- ‘lord of creatures’
candrā-mās- ‘moon’
pūrná-mas(a) ‘full moon’
 παράδειγμα ‘model’ (δείγμα)
 στρατόπεδον ‘army camp’ (πέδον)

By a Sanskrit innovation, stem-final default accent is the rule in (dominant null suffix, oxytone default).

- (42) *hiraṇya-piṇḍá* ‘lump of gold’ (*piṇḍa* ‘lump’)
adhara-hanú ‘lower jaw’ (*hānu*)

Synthetic compounds with a participle or deverbal adjective in *ta-*, *na-*, *īyāms*, *iṣṭha* and with a noun in *ti-* are originally accented on the first member (the BAP again).

- (43) a. *sóma-pīti* ‘soma-drinking’
devá-jāta ‘born of the Gods’
áhar-jāta ‘born in the daytime’
paraśú-vrkna ‘axe-hewn’
hástá-cyuti ‘hand movement’
 ἀνδρόκμητος ‘man-made’

- b. *ní-hita* ‘put down’
canó-hita ‘made pleased’
ví-bhinna ‘split’
úd-iti ‘beginning’
 ἀπόβλητος ‘to be thrown away’

In the Rigveda, second members in *-ta* are found accented after oxytone first members in high vowels and *r̥* — the BAP again, once the unaccented nature of these first members is understood.

- (44) *puru-stutá* ‘praised much’ (or ‘by many’)
kavi-(pra)śastá ‘praised by the wise’
pitṛ-vittá ‘acquired by the fathers’
paśu-páti ‘lord of cattle’
nr̥-páti ‘lord of men’
puru-scandrá ‘much shining’

Most synthetic compounds have an overt compositional suffix, and are accented on the second member on a syllable determined by the suffix.

- (45) *soma-pī-thá* ‘soma-drinking’
soma-pé-ya ‘soma-drinking’
agnim-indh-á- ‘kindling a fire’
māṃsa-bhikṣ-á ‘begging for meat’
ghṛtā-vṛdh ‘enjoying ghee’
 ἵπποφορβός ‘horsekeeper’
 ψυχοπομπός ‘soul-conductor’
 αἰγοβοσκός ‘goatherd’

The accent of synthetic (*upapada*) compounds is also determined by the compositional suffix:

- (46) a. *valaṃ-rujá* ‘cave-breaker’, *dhanaṃjayá* ‘prize-winner’, *vájam-bhará* ‘prize-bearer’,
sutam-bhará ‘soma-bearer’
 b. *agnim-indhá* ‘fire-kindler’, *vácam-inkhayá* ‘voice-raiser’, *viśvam-invá* ‘all-pervading’

The contrast between synthetic and regular compounds is due to their differing constituent structure:

- (47) a. [[sóma] [pī] thá] *somapīthá* ‘soma-drinking’ (a synthetic compound; there is no
 **pīthá*, **péya*, **pa*)
 b. [[sóma] [pī tí] *somapīti* ‘soma-drinking’ (a regular noun compound; *pīti* ‘drinking’
 exists)

A German parallel for this constituent structure effect would be

- (48) a. *Tier-quäl-eréi* [[Tier] [quäl] eréi] ‘cruelty to animals’ (synthetic compound)
 b. *Léihbücherèi* [Léih] [[büch] erèi]] ‘lending library’ (regular compound)

Finally, reduplicative (*āmreḍita*) “compounds” go directly by the BAP.

- (49) *áhar-ahar* ‘day after day’ (*áhar* ‘day’)
yáthā-yathā ‘in whatever way’ (*yáthā* ‘how’)
grhé-grhe ‘in every house’ (*grhé* ‘in a house’)
agním-agnim ‘Agni always’
ánnam-annam ‘food galore’
píba-piba ‘keep drinking’
páñca-pañca ‘five each time’

6 Conclusion

Rather than taking paradigms as basic templatic entities, a compositional analysis of accent and ablaut derives them from accentual properties of the component morphemes of words by mutually conditioning and constraining morphophonological processes. I have proposed a compositional analysis that accounts for the core of Indo-European inflectional accent and zero grade ablaut, and for substantial parts of derivational and compound accentuation.

The main analytic findings of the study are:

- (1) Morphemes may be unaccented or accented on some syllable.
- (2) Word accent (ictus) is predictable from morpheme accents.
- (3) Ablaut (*qua* morphophonological process) is governed by morpheme accents, not by ictus. Zero grade applies before accented morphemes.
- (4) The two main accent rules are the OXYTONE RULE, which assigns an accent to the right edge of an inflectional stem, and the BASIC ACCENTUATION PRINCIPLE (BAP), which erases all accents but the leftmost one, and assigns an accent to the left edge of an unaccented domain.
- (5) The proterokinetic type does not exist.
- (6) The hysterokinetic type is not basic, but displays secondary mobility. It is underlyingly fixed oxytone (“mesostatic”) and its accentual mobility is the result of ablaut, rather than a trigger of it.
- (7) The amphikinetic type consists of a set of stems that do not undergo the Oxytone Rule.
- (8) Fundamentally, there is only a two-way accentual distinction, namely between oxytones and barytones, each with a variety of accentual and ablaut realizations that are predictable from the shape of the stem and the ending.
- (9) Internal derivation is the addition of a deaccenting zero derivational suffix.
- (10) External derivation is the addition of a deaccenting overt derivational suffix.
- (11) The bulk of compound accentuation is accounted for by the BAP. Synthetic compounds have a deaccenting derivational suffix that scopes morphophonologically over the entire compound.

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