

RHYTHM AND THE HOLISTIC ORGANIZATION OF LANGUAGE STRUCTURE¹

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For André G. Haudricourt and Heinz-Jürgen Pinnow

A living language is not just a collection of autonomous parts, but, as Sapir (1921) stressed, a harmonious and self-contained whole, massively resistant to change from without, which evolves according to an enigmatic, but unmistakably real, inner plan. We will draw on the structures and histories of the Munda and Mon-Khmer families of Austroasiatic languages² to argue that this holistic organization is far more extensive even than Sapir imagined, linking all levels of linguistic structure -- from syntax through phonetics -- to each other in the synchrony and the long-term evolution of each language. And we will argue that the inner plan behind this holism of structure and evolution is the *rhythmic pattern* of phrases and words.

The Munda languages differ widely in detail, but they are similar to each other in typology, and so are the Mon-Khmer languages. But Munda and Mon-Khmer are typologically opposite at every level:

	<u>MUNDA</u>	<u>MON-KHMER</u> ³
Phrase Accent:	Falling (initial)	Rising (final)
Word Order:	Variable -- SOV, AN, Postpositional	Rigid -- SVO, NA Prepositional
Syntax:	Case, Verb Agreement	Analytic
Word Canon:	Trochaic, Dactylic	Iambic, Monosyllabic
Morphology:	Agglutinative, Suffixing, Polysynthetic	Fusional, Prefixing or Isolating
Timing:	Isosyllabic, Isomoric	Isoaccental
Syllable Canon:	(C)V(C)	unacc. (C)V, acc. (C)(C)V(G)(C)
Consonantism:	Stable, Geminate Clusters	Shifting, Tonogenetic, Non-Geminate Clusters
Tone/Register:	Level Tone (Korku only)	Contour Tones/Register
Vocalism:	Stable, Monophthongal, Harmonic	Shifting, Diphthongal, Reductive

The genetic relationship of Munda to Mon-Khmer was proposed in the 19th century, and by 1906 Schmidt had adduced a respectable body of cognates. But their opposite typologies led one scholar to wonder whether the two branches were remnants of a language distorted by two substratum races with distinct “laws of thought” (Grierson 1904). And others – most recently Sebeok 1942 – simply doubted the relation. Pinnow's work in the '50s and '60s has silenced the doubters, but it is still widely believed that the divergent structures of the two groups are due to areal influence.

It is true that most of the Munda traits are shared by other language families of the Indian linguistic area -- Dravidian, Indo-Aryan, Tibeto-Burman (Emeneau 1956, Kuiper 1966, Ramanujan & Masica 1969, Masica 1976). And the Mon-Khmer traits are typical of other languages of mainland South-East Asia – Tai, Chamic, Sinitic (Henderson 1965 and numerous pairwise comparisons of syntactic structures, e.g. Huffman 1973). These resemblances are assumed to be due to diffusion: in both areas there has been heavy borrowing at various periods, and early studies called some Munda and Mon-Khmer languages “mixed”.

Deeper studies of the individual languages have refuted the view that they are “mixed”.⁴ Comparative studies have established a breathtaking degree of independence in the evolutions of the individual Munda and Mon-Khmer languages. No doubt their independence is still underestimated, because comparative methodology treats all similar developments which are not *provably* independent as common to a branch of the family tree. When they are provably independent, then the methodology has us treat them as waves of diffusion. And since “sources” for these waves are easy to find in India or in SE Asia, all the coincidences can be explained away.

This is an issue broader than Munda and Mon-Khmer. In South and SE Asia, divergent and subsequently parallel evolutions occur also in Tibeto-Burman and Sinitic, Indonesian and Chamic, and Khamti-Tai and Thai. In Europe, similar contrasts will come to mind between the early and modern structures of Germanic, Celtic, Romance, etc.⁵ We have chosen to compare Munda and Mon-Khmer, however, because in them the tendencies we are speaking of have run full course, and because their significance has been missed because of the misconception that the tendencies were merely areal.

Furthermore, as we will point out in a brief historical excursus below, there is no morphological evidence that these parallels are due to diffusion, especially at the remote dates when Munda and Mon-Khmer structures were formed. Our purpose is not to argue specialist issues here. Rather we hope to show that there alternative explanations of parallel evolutions, explanations without trees or waves, which, though they leave little for the historian, may hold much for the linguist.

But when we compare the typologies of Munda languages with the typologies of Mon-Khmer languages, we see that languages of the two groups are not just different in typology: they are *opposite*. This oppositeness, at every level of structure, could never be explained by diffusion alone. The polar opposition between the Munda and Mon-Khmer typologies requires a structural explanation, not just a historical one. As Grierson put it, we are looking at “opposite laws”.⁶

WORD ORDER AND PHRASAL ACCENT

Munda and Mon-Khmer word orders are mirror opposites in all major syntactic phrase types. Schmidt 1926, Greenberg 1965, Lehmann 1973, and Vennemann 1975 have shown that there are not n^2 but only 2 main ways that phrases are ordered: heads and their modifiers (including complements) tend to be unidirectionally ordered. In Austroasiatic this tendency has run full course: Munda languages have **modifier-first**, and Mon-Khmer languages, **modifier-last**, ordering.⁷ To mark the modifiers in this contrastive chart, we use bold face:

<u>MUNDA</u> (Sora)	<u>MON-KHMER</u> (Khmer)	
[O V] kəmbəl-ən ₂ ken-əl-t-ε ₁	[V O] məəl ₁ siəwphiw ₂	reads ₁ a book ₂
[Dat [O V]] dəŋ-ŋEn ₂ kəmbəl-ən ₃ tiy-t-ε ₁	[[V O] Dat] qaoy ₁ siəwphiw ₃ khnom ₂	gives ₁ me ₂ a book ₃
[Adv V] omen ₂ yer-t-ε ₁	[V Adv] tiu ₁ rəha!s ₂	goes ₁ quickly ₂
[[N Adp] V] si?iŋ ₃ -leŋ-ən ₂ dəko-t-ε ₁	[V [N Adp]] niw ₁ knoŋ ₂ pteəh ₃	stays ₁ in ₂ the house ₃
[[Adv Adj] N] bəybəy ₁ sənna ₂ si?iŋ-ən ₃	[N [Adj Adv]] pteəh ₃ to: c ₂ nos ₁	very ₁ small ₂ house ₃
[Gen N] yoyo-n ₁ ə ₂ -si?iŋ-ən ₃	[N Gen] pteəh ₃ ta: ₁	grandfather ₁ 's ₂ house ₃
[[N Adp] N] si?iŋ ₃ -leŋ-ən ₂ kəmbəl-ən ₁	[N [Adp N]] siəwphiw ₁ knoŋ ₂ pteəh ₃	the book ₁ in ₂ the house ₃

Modifier-first ordering is typical of Indian languages generally, and modifier-last ordering, of SE Asian languages. (The exceptions, notably NA order in Tibeto-Burman and AN order in Sinitic, are not merely historical oddities, but we cannot deal with them here.)

The semantic-syntactic basis of the head/modifier relation is explicit in categorial and dependency grammar (Bar-Hillel 1954, Tesnière 1959): in endocentric constructions, a verb with its complement is a verb, and a noun with its modifier is a noun. To run fast is to run, a cat in a hat is a cat.

But why should this relationship of head/modifier be ordered unidirectionally? Parsability is obviously a factor. Mixed-order constructions like *the king of England's hat* violate Behaghel's Law (1923, cited by Vennemann 1975) that what goes together in sense goes together in syntax.

Here the (older) ordering Gen N (*king's hat*) and the (newer) ordering N Gen (*king of England*) clash; contrast the harmonic [Gen [Gen N]] (*England's king's hat*) and [[N Gen] Gen] (*the hat of the king of England*).

But if this were all there were to it, we could not get beyond syntax. There is in addition a relationship of information, in which in the ordinary case the head is **given**, and the modifier is, in effect, **asserted**. Note that for any modifier there exists an *interrogative* word, so that it can be questioned vis à vis the head -- but there are no head-interrogatives.⁸ Again, boldface marks modifiers:

[V O] He read a book .	What did he read? *WH-Verb he a book?	A book. Read.
[V Adv] He read quickly .	How did he read the book? *WH-Verb he the book quickly?	Quickly. Read.
[Mod V] He wants to read .	What does he want? *WH-Modal he read?	To read. Wants to.
[Adp N] He came from Paris .	Where did he come from? *WH-Adp did he come Paris?	Paris. From.
[N Adj] Un livre rouge . ⁹	Which book did he read? *What red (thing) did he read?	A red (one). A book.
[N Gen] Un livre de Jean .	Whose book did he read? *What of John('s) did he read?	John's. A book.

Now note that the boldface not only marks the modifier relative to its head, but also the **phrase accent**. Modifiers take the accent from their heads, even when their order is reversed:

Her feelings were hurt.	It hurt her feelings .
A picture book.	A book of pictures .
A pruning knife.	A knife for pruning .

Bolinger (1950 and many other papers) has shown that new information takes the phrasal accent. And we have shown that it is the modifier which typically holds new information. Thus **modifier-first order means phrase-initial accent, and modifier-last order, phrase-final accent**.

Word order therefore has a rhythmic as well as a syntactic basis. A regularization of phrasal accent would represent a regularization of phrasal rhythm. Which causes which? The syntactic and rhythmic divergence of Austroasiatic was so remote in time that it is not likely to furnish us answers to such a question. What is important to us here is simply the link of order to accent, because **accent is the only factor pervading all the levels of language**, and the only factor

capable of explaining the specific typological tendencies at each level in evolutions such as those of Munda and Mon-Khmer.

In Munda, with modifier- and accent-initial phrases, there is therefore what we shall call a **falling** pattern. In Mon-Khmer, with modifier- and accent-final phrases, there is a **rising** pattern.

HISTORICAL EXCURSUS

Proto-Austroasiatic word order was of the “rising” type: this order occurs not only in Mon-Khmer syntax but also in morphologized constructions in Munda languages. In Sora, rising order persists in an archaic but still productive “morphological” style of speaking, alongside the falling order in a younger “syntactic” style:

<u>SORA</u> (“syntactic style”)	<u>SORA</u> (“morphological style”)
[O V]	[V - O]
bɔŋtɛl-ən ₂ ə-dəŋ ₃ gəd ₁ -l-ɛ	gəd ₁ -bɔŋ ₂ -l-e-n killed ₁ a buffalo ₂ (acc ₃)
[Dat V]	[V - Dat]
<u>SORA</u> (“syntactic style”)	<u>SORA</u> (“morphological style”)
dəŋ-ŋɛn ₂ tiy ₁ -l-ɛ	tiy ₁ -l-iŋ gave ₁ (it) to me ₂
[Adv V]	[V - Adv]
kuddib ₂ jom ₁ -l-ɛ	jom ₁ -aj ₂ -l-ɛ ate ₁ it up ₂
[[N Adp] V]	[V - N]
si?iŋ ₂ -ba ₃ -n dəko ₁ -t-ɛ	dəko ₂ -siŋ ₂ -t-e-n stays ₁ at ₃ home ₂ (loc ₃)
[V Modal]	[Modal - V]
ə ₃ -yer ₂ -ben ₃ idsim ₁ -l-ɛ	məl ₁ -yer ₂ -r-ɛ wanted ₁ to ₃ go ₂
[A N]	[N - A]
bɔŋtɛl ₁ -ən ə ₃ -səŋ ₂	əsəŋ ₂ -bɔŋ ₁ buffalo ₁ (’s) ₃ dung ₂
[Gen N] (3rd p. Gen)	[N - Gen] (2st or 2nd p. Gen)
anin ₁ ə ₄ -si?iŋ ₃ -ən	si?iŋ ₃ -ŋɛn ₂ his ₁ /my ₂ house ₃ (gen. ₄)

The antiquity of the rising order is clear not only from its morphologization but also from numerous restrictions on it which have only a historical basis. E.g. in ‘my house’ the old (proto-Austroasiatic) pronoun *ŋɛn* is postposed, as in Khmer, whereas in ‘his house’, the innovated *anin* (peculiar to Sora and its sister language Gorum, from a old demonstrative) is preposed, as is any noun.

Sora has many nouns which have two allomorphs, a bi- or trisyllabic free form and a monosyllabic form which is used only in compounding: *bɔŋtɛl/-bɔŋ* ‘buffalo’, *əsəŋ/-səŋ* ‘feces’, *si?iŋ/-siŋ* ‘house’, *kimməd/-məd* ‘goat’, *mənra/-mər* ‘man’, *insəlɔ/-bɔj* ‘woman’. In fact, the old morphological constructions are open only to nouns with monosyllabic forms. This recalls the monosyllabic tendencies of Mon-Khmer and other rising-type languages, and indeed it is the monosyllabic forms which typically have Austroasiatic etymologies, whereas the long forms were often formed later by compounding.

Most of the Munda languages have somewhat polysynthetic verbs, and this reaches an extreme in the Sora morphological style:

ɲɛn əd- məl- jom -ɣɔ -aj -t -en -ay
 I not- want- eat -fish -all -pres. -intr. -1p.
 (I don't want to eat all the fish.)

The Khmer equivalent is identical except in lacking inflections:

khnom mɨn caŋ ɲəm tray cap
 I not want eat fish all

This was the word order of proto-Austroasiatic, with rising-ordered verb phrases, and it appears that in various Munda languages these phrases were simply reinterpreted as single words – perhaps because phrase-initial and -final verb modifiers were reinterpreted as inflectional affixes, which typically impose closure on words. The same verb phrase expressed syntactically in Sora shows a complete mirror-image reversal of elements to the innovative falling order:

ɲɛn kuddɨb əɣɔ -n -ə-dɔŋ ə jom -ben idsɨm -t -ay ted
 I all fish -art. -acc. inf.- eat -inf. want -pres. -1p. not

But order is only half the story. Mon-Khmer has neither inflections nor suffixes, and neither did proto-Austroasiatic, but Munda has scores of them. Note first the case suffixes. Case marking is so typical of OV languages that Vennemann (1973) hypothesized that its loss, by phonetic decay, is what causes changes to VO order. But Munda made the opposite change without case suffixes, and did without them for so long that the ones which did develop are mainly peculiar to the individual languages, e.g. Sora's object suffix *-dɔŋ*, which still retains a literal meaning ‘body of’.

Second, note the complex derivational and inflectional verb morphology, again largely suffixal. Pinnow, in “A study of the verb in the Munda languages” (1965), provided etymologies of many of these suffixes. Few of these reconstruct as suffixes to proto-Munda, i.e. they have been developed in the individual languages. And none, excepting some recently borrowed Indo-Aryan derivational affixes which are limited to the words in which they were borrowed, can be matched to areal languages. In fact, the Munda languages are far more agglutinative and polysynthetic than is typical of India. The significance of this change to OV order, case-marking, and complex verbal morphology in Munda has been lost to linguistic theory because it has been dismissed as merely an Indian areal convergence. As we have seen, at close range there is really no evidence of this. And lacking such evidence, there is no more reason to assume that typology resemblances of Munda to Indo-Aryan or Dravidian prove mutual influence, than it was for earlier scholars (bibliographies Pinnow 1959) to assume that typological resemblances of Munda to Australian, Austronesian, Dravidian, Finno-Ugric, Basque, or Japanese prove mutual genetic relationship.

The facts of Munda point clearly to independent parallel developments, and therefore they call for an explanation in terms of some factor within the languages. But they just as clearly refute the theory of Vennemann which links word order to case marking directly. (Anyway, even in

the OV-to-VO changes on which he focused, the phonetic decay of case suffixes sometimes follows rather than precedes word order change. And the decay of case need not occasion syntactic change: the worn-down suffixes may simply be replaced by new ones.) It is only with a *change of phrase accent pattern* that a change of syntactic and morphological typology occurs. If the accent pattern stays unchanged, so does the grammatical typology. Thus in falling-accented Dravidian, OV ordering and suffixing morphology have survived millenia. And in rising accented Mon-Khmer, VO ordering and prefixing morphology have survived since proto-Austroasiatic.

PHRASE ACCENT AND WORD ACCENT

We have argued that the divergent word orders of Munda and Mon-Khmer were linked to the change in Munda from rising to falling accent. To account for their divergent morphologies and phonologies we have to link phrase typology and word typology. These are linked not directly but through the link of phrase accent to word accent, which coincide when phrases and words coincide as *one-word phrases*.

In Munda, falling phrase accent in every language coincides with falling word accent, i.e. accent on the word-initial syllable (it can skip over a light initial syllable to a following heavy syllable, cf. Sora *pəsej* or *pə'sej* 'child'). In Mon-Khmer, rising phrase accent in every language coincides with rising word accent, and in fact with accent on the final syllable. (In Vietnamese and Muong, which are monosyllabic, one would reconstruct rising accent because the etymologically missing syllable is never the last.) The same coincidence of phrase and word accent, falling or rising, is typical of languages in India and SE Asia generally.

As we have seen, proto-Austroasiatic had a "rising" syntactic typology. This, and its prefixing tendencies (next section), point to a rising phrase accent. This points in turn to a rising word accent. This is confirmed by the fact that the vowel inventories of final syllables in both Munda and Mon-Khmer reconstruct as identical to the rich inventories of monosyllables – which would have been accented. In non-final syllables we find few reconstructable vowels, as if they were reduced by lack of accent, or even as if they were anaptyctic.

WORD ACCENT AND AFFIXATION

Mon-Khmer and other language families of mainland SE Asia are well known for having only prefixes (or infixes which form initial syllables), and lacking suffixes entirely. This is also reconstructed for proto-Austroasiatic. Munda languages preserve several old prefixes, e.g. a **k-* prefix in certain animal names, an **n-* prefix or infix in nominalized verbs, etc. But in addition Munda languages have scores of new suffixes, e.g. in a typical Sora noun and verb:

siʔiŋ₁-ən₂-ji₃-leŋ-ən₅

in₄ the₂ house₁-s₃

koŋ₁-aj₂-dəm₃-l₄-e₅-n₆-ji₇-den₈

if_{6,8} they_{5,7} had₄ completely₂ shaved₁
themselves₃

None of these reconstruct as affixes in proto-Austroasiatic, with the significant exception of a few (e.g. the article) which reconstruct as prefixes. In fact, as noted earlier, very few of these suffixes reconstruct as such even in proto-Munda. Suffixation was an independent parallel tendency in the evolution of each Munda language, and remains so. And although the same is true of the Indian languages, notably the Dravidian languages which lack prefixes entirely, the suffixes of Munda are not borrowed.

Suffixation and prefixation are tendencies that directly reflect falling and rising word accent, respectively, in India and SE Asia, and – if we are careful to distinguish the living tendencies from tenacious historical conventions – also elsewhere in the world. Accent, as we have seen, has a foregrounding function, and therefore putting merely grammatical elements under the accent is avoided. For the same reason, accent skips over the clitics, and often also the affixes, of a word, to one of the root syllables.

But this is putting it negatively. Accentuation is the reason for clisis and affixation in the first place, in that it subordinates the unaccented element to the accented, and thus typically the merely grammatical element to the lexical. Thus **falling accent encourages enclisis and suffixation; rising accent, proclisis and prefixation.**

But ultimately we should not take the subordinating function of accent for granted; we should ask why elements in construction should contrast in accent in the first place, in particular so that the more intimate the construction the greater the contrast. We think that a full understanding of this requires a recognition that accentuation is not merely prominence but prominence in *time*. Such a conception is already implicit in the hierarchic notion of accent in musical measures, where notes and phrases are separated by times inversely proportional to their accentual contrast. In “putting words to music”, elements in less intimate construction are given nearly equal accent, as in a phrase (e.g. *new town*), because this keeps a “rest” between them, while elements in closer construction are given increasingly contrasting accents so that they that they are drawn together (e.g. *new-town*, *Newton*). It is this temporal character of accent that explains the familiar shift of accent of e.g. *Chi'nese* to *'Chinese* in phrases like *'Chinese 'language 'teacher* (teacher of the Chinese language), since the abutted accents in *Chi'nese 'language 'teacher* (language teacher who is Chinese) entail a “rest” between Chinese and language, corresponding to their greater semantic distance. Generalizing Behaghel's Laws, cited above: **What goes together in sense goes together in time.** And therefore must contrast in accent.

ACCENT AND CASE

It is well known that case affixes often arise from the clisis and affixation of function words, esp. adpositions or locative nouns, to nouns. The case suffixes which have developed in the

various Munda languages have had this origin; as we have seen, enclisis and suffixation are compatible with falling phrase and word accent. Languages with falling accent (e.g. Dravidian, Uralic, Altaic, Basque, etc.) have some of the world's most elaborate case systems.

In the world's languages, **case marking is suffixed**, and rarely if ever prefixed. This is rather surprising, since prepositions can be proclitic, and even prefixed, as in Russian, and we frankly do not know any explanation for the fact that they do not become case prefixes. But it *is* a fact, and it enables us to explain why languages with rising word accent, like Mon-Khmer and other SE Asian languages, do not develop case marking, and why languages like Germanic or Romance which change from falling to rising accent fail to replace case-markings which are lost through phonetic decay.

We have already argued, against Vennemann, that case-marking is not linked to OV ordering by any syntactic principle. The link, we believe, is due to the link of case with suffixing, suffixing with falling word accent, falling word accent with falling phrase accent, and falling phrase accent with modifier-first (OV) word order. To be sure, case-marking does have important consequences in word order, in particular that it frees word order for functions other than the expression of case, and this is true of Munda. But we think that the link of case-marking to word order typology is mediated by accent.

ACCENT AND RHYTHM

Phonological typology has sometimes been conceived in terms of phoneme inventories or morphophonemic alternations, but these are of limited significance for our purposes because they are in large part an accident of history, and are capable of being borrowed. (Some acculturated Munda peoples have borrowed enough vocabulary from local Indo-Aryan dialects to have incorporated their entire phoneme inventories and most of their derivational morphophonology.) Rather our aim is to characterize what is persistent and recurrent in Munda and Mon-Khmer phonology. We believe that this is linked to their accent patterns, but only through the intermediate level of rhythm.

Languages can be classified rhythmically according to whether they use, as their unit of isochronous speech, the **word** (*isoaccentual* rhythm, in measures of at least two moras), or the **syllable** (*isosyllabic* or *isomoric* rhythm, depending on whether short vs long syllables are distinguished). In mapping these units onto time, only the material in the “*rhyme*” of the word or syllable – from the accented syllable to the end of the word, and from the nucleus to the end of the syllable – is rhythmically relevant. The preceding material is rhythmically irrelevant (*anacrustic*), and can be added or lost without any compensatory changes elsewhere in the rhythmic unit.

Word-rhythms are dominant. We can see this in monosyllabic Vietnamese, which could treat its words as syllables (one mora) or as words (two moras), but treats them as words. However, there are two conditions for word-rhythm: First, that there is hiatus at word boundaries; languages which allow liaison fail this condition, and are therefore syllable-timed (French, Italian). Second, that the rhymes of most words are short enough to be spoken in two moras (this may include “triplets” like English *sleepier*); most falling-accented languages fail this condition,

because in such languages the whole word may be in the rhyme, including suffixes and enclitics, and therefore they are syllable-timed (for example, the Munda languages and other languages of India, as well as Uralic and Indo-European). The rest are word-timed, e.g. the Mon-Khmer languages and other languages of SE Asia, Germanic languages, Portuguese, Old French, etc.

Thus there is a link between **falling accent and syllable rhythm**, versus **rising accent and word rhythm**. This link has not been observed before, to our knowledge, perhaps because it is nowhere as evident as in contrasting the languages of India vs SE Asia. However, it is not impossible to discern the same link in European languages, which in their shifts from falling to rising accent have shifted from older moric rhythms to stress-timed rhythms.

Mon-Khmer and most SE Asian languages have *isoaccentual* (stress-timed) rhythm, an unmistakable symptom of which is the polarization of their accented and unaccented syllables into what specialists call “*major*” and “*minor*” types (Shorto 1960), the latter having a vowel we would call “reduced” in English. The anacrustic character of minor syllables allowed them to be deleted altogether in Vietnamese and Muong. We have already remarked on a similar inequity between proto-Austroasiatic syllables, and therefore can conclude that its rhythm was also isoaccentual. It should be noted also that all SE Asian languages mark the hiatus between words by using *checked (unreleased) final stops*, a characteristic which the Munda languages have inherited. In major syllables, proto-Austroasiatic had a distinction of long and short vowels. For isochrony these were neutralized to long in open syllables (as in accented open monosyllabic words in early Germanic); in closed syllables some Mon-Khmer languages (e.g. Mon) neutralized them to short, but others kept them distinct, we suspect by phonetic lengthening of consonants after short vowels and shortening after long vowels, as in Scandinavian languages.

The Munda languages inherited these short iambic words, but in shifting to falling accent, they eradicated the distinction of short and long vowels in the major syllable, and they promoted the vowel of the minor syllable to a full vowel, usually by harmonizing it to that of the second syllable. **Vowel harmony** is nonexistent in Mon-Khmer, but it is facilitated in languages with falling accent (not only Munda but many Indo-Aryan and Dravidian languages, as well as Uralic, Altaic, etc.) because with falling accent all the syllables of the word fall into a single rhythmic measure. More important, in shifting to a falling accent, the Munda languages began to encliticize and suffix, with the result that, in Sora, for example, inflected nouns rarely have fewer than three syllables, and even unincorporating verbs may have six or seven. This made word-rhythms impossible, and therefore they shifted to syllable-rhythms, specifically *isomoric* rhythms because of their inherited distinction between open and checked syllables. Because of this rhythm, when syllable-final consonants are completely assimilated to a following consonant, they are not simply deleted but remain as the first element of a *geminate consonant*, e.g. Sora *ebba* ‘thorn’ < *ed-ba* ‘scratch-flower’, *bAttɔŋ* ‘frighten’ < *bə-b-tɔŋ* ‘cause to fear’. Isomoric rhythm is also evident in the meters of Munda songs.

RHYTHM AND SYLLABIC CANONS

To illustrate the effects of rhythm on syllable canons, here is a typical Austroasiatic word ('thigh') in proto-Austroasiatic (AA), proto-Munda (MuA), and proto-Mon-Khmer (MKA), both of which are preserved in conservative dialects, as opposed to sample progressive dialects (MuB, MKB). Our rhythmic notation reflects the minimally two-mora duration of accent measures mentioned above, and uses an eighth note to equal one mora:

AA *bə'lu: MuA 'bulu MuB 'bul MKA bə'lu: MKB 'plau

The AA and MKA forms are identical, with the accented syllable given both moras. This favors diphthongization (MKB). The unaccented (minor) syllable, on the other hand is given no moras; it is treated as an anacrusis (or "pick-up" syllable), i.e. as rhythmically null. As noted earlier, this favors aphaeresis (MKB). Aphaeresis does not necessarily entail monosyllabism unless, as in Vietnamese and Muong, prefixation ceases; but it does lead to complex clusters of consonants in the onset of major syllables. This was already a feature of proto-Mon-Khmer, and its continuing occurrence is what is responsible for the notorious complexity of clusters in Mon-Khmer, from Khmer's inventory of 70 to Khasi's of some 140. Since minor syllables lack rhythmic status, these consonant clusters never include geminates; assimilation leads simply to deletion in these languages, e.g. in Khasi casual speech.

The MuA form, typical of most Munda languages, distributes the two moras of the measure evenly on the two syllables. In a few languages, and in combining forms in others, the final vowel has been lost (type MuB), but the remaining closed syllable keeps both moras. However, the strict one- or two-mora pattern of Munda syllables enforces a rigid (C)V or (C)V(C) syllable canon. Thus it permits syncope only if it does not change mora value, e.g. in Kharia *boksel* < **boko-sel* 'sister-in-law' (*bok* and *boko* both are two-mora measures); doubly-closed syllables are avoided, a common therapeutic device being the conversion of a "blocked" nasal to vowel nasalization, e.g. Juang *sinri* > *sindri* > *sīdri* 'cloth'. And in India generally, isosyllabic and isomeric rhythms are responsible for a similar rigidity of syllable canon, and for such secondary effects as a far more wide-spread occurrence of nasalized vowels than in SE Asia.

RHYTHM AND CONSONANTS

We have related the "checked" pronunciation of final consonants in SE Asia to word-hiatus associated with isoaccentual rhythm, but this *stød*-like feature was inherited syllable- as well as word-finally in Munda. Curiously, these checked consonants appear as voiced before vocalic suffixes. In Santali and other dialects which have borrowed the 4-way voicing x aspiration distinctions in stops in Indo-Aryan words, the native stops remain as a distinct series. In both branches, the checked pronunciation is reflected in changes of certain stops, usually but not always the velar, to a glottal stop, or null.

In onsets, Austroasiatic had a voicing distinction in stops which both branches inherited but only Munda invariably preserves. This conservation of consonant phonations, which is typical of India (as in the preservation of Indo-Aryan stop series) and in isomeric languages generally, can be attributed to the absence of intrasyllabic clusters in the CVC syllables typical of these languages: every consonant has the phonetic support of an adjacent vowel.

But in Mon-Khmer, as we have seen, onsets are often clusters, susceptible to mutual assimilation (e.g. Ferlus 1971), and since onsets are anacrustic a completely assimilated stop simply disappears. Assimilation is less likely between less similar sounds, and dissimilation can block it. Of the occurring types of dissimilation, the most common are hardenings which aspirate voiceless and devoice voiced stops. In Khmer, for example, stops are aspirated before consonants except *s*. But in some languages *all* voiceless stops in onsets are aspirated. And already in Khmer voiced stops in onsets had devoiced. The dissimilation of a stop from an adjacent consonant is generalized to a dissimilation from vowels as well, hardening stops in onsets generally. **Consonant shifts** like this occurred, and keep occurring, separately in most of the Mon-Khmer subgroups (Haudricourt 1965), and in languages of every family in SE Asia, and in other isoaccental languages, e.g. Germanic. Although their strong stress contributes to this tendency, we believe that their equally characteristic clusterings of initial consonants, fed by aphaeresis (cf. German *g'nadig*), is an even more important factor, and that the shifts originate in the dissimilation of stops, by devoicing and other hardenings, from adjacent voiced consonants in the clusters. This is generalized to a dissimilation from *any* voiced segment, including vowels.

RHYTHM AND TONE / REGISTER

In 1954 Haudricourt showed that the tones of Vietnamese, previously considered a Sinitic or Tai language, had Austroasiatic origins, reflecting neutralized consonant phonations. The **contour** or two-level character of these tones, which are typical of SE Asia, clearly relates to the two-mora stressed syllables on which they occur in these languages (cf. the diphthongizations in the next section). The **voice register** distinctions (Henderson 1952) of Khmer and other Mon-Khmer languages have been established, on philological, comparative, and synchronic evidence, to have similar derivations (e.g. Huffman 1976). Tone and register rephonologize the phonation distinctions lost in the consonant shifts of SE Asia. Register, in particular, may in turn rephonologize in vowel quality, as in Khmer and many other Mon-Khmer languages (Gregerson 1976).

In India, the rephonologization of consonant phonations as tone is rare because, as noted above, phonations are stable in isomeric languages, but it has occurred in the Indo-Aryan language Punjabi, and in the Munda language Korcu (Zide 199b): the tones are **level**, matching the majority one-mora syllables of isomeric languages (cf. Africa).

RHYTHM AND VOWELS

Since phonological processes operate on syllable or measures, the **vowel harmony** vs **vowel reduction** respectively in Munda vs Mon-Khmer minor syllables, already described, follows

from the inclusion vs exclusion of those syllables in the accentual measure in falling vs rising accentuation. Harmony recurs independently in all the Munda subgroups, and in other falling-accented languages of India and the world (e.g. Uralic and Altaic); reduction occurs in unaccented syllables in Sanskrit and other borrowings in Mon-Khmer and other SE Asian languages, and in many isoaccentual languages of the world (e.g. Germanic, Slavic, early Romance, Celtic).

SE Asian vowel systems, including proto-Austroasiatic and most Mon-Khmer languages, have, for reasons as yet unknown, a back or central unround series. These vowels can be reconstructed in every Munda subgroup (Munda 1969, Stampe 1978, A. Zide 1982, N. Zide 1965, 1966b), but they have been eliminated separately in each language by fronting, rounding, or lowering, resulting in five-vowel systems typical of Indian languages. Only Sora keeps the un-Indian vowels, and then only before consonants, which suggests that their intrinsic shortness is incompatible, in isomeric rhythm, with the intrinsically longer tense or open vowels of the triangular system. Otherwise, Munda vowels have been relatively stable, as is typical of those of Indian and other languages with syllable-rhythms. It is an entirely different story in Mon-Khmer and SE Asian and other languages with isoaccentual rhythms, where accented vowels suffer repeated shiftings and diphthongizations. The phonetic and phonological motivations for these complex transformations have been worked out in detail by Donegan (1978), and we will sketch only the main lines here.

The protraction of vowels in accented syllables forces short vs long distinctions to be recoded as lax vs tense, or given their two-mora rhythm, more often as “ingliding” vs “outgliding” diphthongs. The syllabics of diphthongs dissimilate from their glides (as noted above this blocks assimilation). Thus in ingliding diphthongs they tense and raise, while in outgliding diphthongs they lax and lower and also may dissimilate their timbres. Thus the syllabics of ingliding diphthongs shift toward i, u, and ü; and those of outgliding diphthongs shift toward a, while their glides tend toward i, u, and ü. These developments have occurred in languages of every family in SE Asia, and (substituting ü for i) are familiar in most branches of Germanic.

Registers have effects on vowel processes, in particular that the breathy register tends to block the outgliding diphthongization, so that the vowel qualities double. In Khmer, the new qualities have largely supplanted register as distinctive. Where these events have occurred repeatedly, we find vowel systems with as many as three or four dozen vowels and diphthongs – considerably outnumbering the consonants!

The following Austroasiatic words illustrate some of the vocalic developments described here:

	<u>MUNDA</u>	<u>MON-KHMER</u>
*thigh	Sa., Mu., So. <i>bulu/-bul</i>	Khm. <i>blau</i> , Pal. <i>bleu</i> , Tar. <i>pelau</i>
*six	Ku. <i>turu</i> , So. <i>tudru</i>	Mon <i>turow</i> , <i>taraw</i> , Suk <i>trou</i> , Huei <i>treu</i>
*hand	Kh., Mu. <i>ti?</i> , So. <i>si?i</i>	Mon <i>tei</i> , <i>tai</i> , <i>toa</i> , Pal. <i>dei</i> , <i>dai</i> , Wa <i>tai?</i>
*louse	Ju. <i>i-si</i> , So <i>i?i</i>	BoLu. <i>səi?</i> , Prae <i>sei?</i>
*dog	So. <i>kín-səd</i> , Gu., Re. <i>gu-so</i>	Wa <i>saw</i> , Rum. <i>shaɔ</i> , Semg. <i>cua</i>

*fever	So. <i>ə-su</i> , Mu. <i>ha-su</i> , Sa. <i>ha-so</i>	Wa <i>sao</i> , Son <i>sau</i> , BoLu. <i>səu?</i>
*eat	So. <i>jom</i> , Gu., Re. <i>som</i>	Sre <i>siam</i> , Rasa <i>chiem</i>
*forest	Sa., Mu. <i>bir</i> (< <i>*biri</i>)	Sre <i>bri</i> , Pal. <i>brei</i> , Khm. <i>brai</i> , Praok <i>pray</i>

LANGUAGE, VERSE, AND MUSIC

In the final chapter of *Language*, Sapir turned to verse structure, which “is not an absolute ... to be imposed from outside models, but merely the language itself, running in its natural grooves” (227); “study carefully the phonetic system of a language, and you can tell what kind of verse it has developed” (230). Yet literary historians have attributed the change from alliterative to rhymed verse in the history of Germanic and Celtic, for example, to Romance influence, when in fact these changes – which had also occurred in Latin! – simply accompanied the linguistic changes from falling to rising phrase and word accent in these languages; and the same can be said, of course, of their changes from the Indo-European quantitative prosodies to accentual prosodies.

Worse still, music historians have often attributed the concomitant changes in European music structure (from quantitative to accentual rhythms, additive to multiplicative meters, monophony to polyphony and harmony, and from modal to tempered scales) to “civilization”! Yet polyphony already existed in Bede’s day among the “barbaric” Welsh, whose Celtic forefathers were the first in Europe to adopt VO syntax. We cannot explain these links here, but their existence seems real.

Again, the Austroasiatic languages present the reverse of the European evolution in verse and music as well as in language. Both Munda and Mon-Khmer verse is characterized by grammatical parallelism, with variable-words embedded in otherwise identical couplets. The variable-words are often drawn from parts of the conjunctive compounds of everyday speech (Hoà 1965, Vitebsky 1978); e.g. the Sora compound *kɪnad-əyɔ* ‘crab (and) fish, i.e. aquatic creatures’ appears in the variable positions of this couplet in a shaman’s song against fever (Vitebsky 1978):

*kɪnad*₁-*sɪŋ-da-ge*₃ *de-ay-te*₄ *kəni*₅;
*əyɔ*₆-*sɪŋ-da-ge* *de-ay-te* *kəni*.

May₄ she₅ be₄ as₃ the home₂ of the crab₁;
 may she be as the home of the fish₆.

(That is, ‘May she be cool as water’.)

But here the similarity between Munda and Mon-Khmer ends. Munda's variable-words come at the beginnings of lines, Mon-Khmer’s at the ends. If they use any coupling device, Munda verse uses front-rhyme (alliteration), while Mon-Khmer verse uses end-rhyme. Munda verse meter counts moras (on Mundari, Munda 1976); but Mon-Khmer meter counts accentual feet. These divergences are characteristic, again, of the Indian and SE Asian areas generally. And they are repeated in their respective music structures. Thus Munda songs have additive (non-

factorable) rhythms; Mon-Khmer's are multiplicative. Munda songs are monophonic (choral singing is unison) and modal, whereas Mon-Khmer songs – those we have heard – are often polyphonic and harmonic. And again this is typical of India vs SE Asia generally.

Poets and singers of every culture have insisted that, in verse and music, the ideal form of the language is manifest. Could this not be because verse and music typology is dichotomized into falling vs. rising types, like language? If so, the ideal would lag behind or run ahead of the evolution of the language itself. For example, recall how Old English alliterative verse favored OV word order long after prose had shifted to VO; or the way Modern English rhymed verse invites NA order, as in “fiddlers three”, while prose retains AN order.

* * *

If the structural links we have posited are real, then none of this should be surprising. As we have pointed out, accent is the only factor which pervades every level of language structure. The Munda and Mon-Khmer languages, and the Indian and SE Asian areas generally, show that in time every level of a language joins in its typology and evolution. What but accent could be behind such holism?

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NOTES

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¹ This paper includes materials from talks at SUNY Buffalo and at the Second International Conference on Austroasiatic Linguistics in Mysore, 1978; Sussex, Stockholm, Salzburg, Osmania, Hong Kong, and Hawaii, 1979-80; the Central Institute of Indian Languages in Mysore and the Calcutta Linguistics Club, 1981. We thank E. Annamalai, Paul Benedict, Gérard Diffloth, Ben Tsou, and Norman Zide for comments on earlier versions. And we thank Theo Vennemann for his trailblazing work. Parts of this research were supported by AIIS, APS, Fulbright, NEH, NSF, and the Ohio State University Graduate School, College of Humanities, and Instructional and Research Computer Center.

² For Munda references, see Stampe 1965-66, Zide 1969, Nagaraja 1989; for Mon-Khmer, Shorto et al. 1963 (updated regularly in the journal, *Mon-Khmer Studies*), and a bibliography in progress by Frank Huffman [now published, Yale U. Press, 1986]; for both families, the works of Pinnow cited below. Diffloth 1973 provides a brief overview of Austroasiatic. Much Munda material cited here is from our own notes.

³ We mean Mon-Khmer in the broad sense, including all of Austroasiatic (including Vietnamese and Muong) except the Nicobarese languages (omitted for brevity's sake) and Munda languages.

⁴ Sapir, in a little-known letter to Ramamurti regarding his grammar of Sora (1931), quoted in an advertisement published at the end of Ramamurti 1933, said: "In recent general linguistic surveys by Keickers, by Meillet and Cohen, and by Father Schmidt ... Savara is classified as a mixed Munda language, owing to supposedly serious influence exerted by Aryan and Dravidian. I gather from what you say that the language ... is to be classified without reservation with such typical Munda languages as Santali. This interests me very much on general principles for I am always skeptical of the truth of the statements often made in regard to languages exhibiting mixed morphological features. My feeling is, that while vocabulary and phonetics from outside may influence a language to a most far-reaching extent, the fundamental structure tends to remain more or less intact. There are few languages that are more mixed than English, yet I think that it is quite right that we classify it as a Germanic language. Similar remarks probably apply to the great majority of languages currently described as 'mixed'."

⁵ Unfortunately, the historical handbooks often obscure the parallelism and independence of the typological shifts in the evolution of modern European languages, and in recent linguistics this has been further obscured by exaggerations of the importance of language contact and of the degree to which borrowings are integrated into the structure of a language. To cite a familiar example, it is simply not true, as has been suggested in recent works, that English accent is borrowed from Romance, or that the morphophonology borrowed in Romance words constitutes the "sound pattern" of English. After half a millenium those borrowed alternations still are restricted to precisely the vocabulary they were borrowed in, and not one operates in native words. Language is no melting pot.

⁷ We treat some phrases in combination, both for brevity and to show that the principles given can account for the ordering of Dat and O, for example, if Dat is understood to be a modifier of the transitive verb phrase. Also we treat adpositional phrases, which are exocentric, together with their heads; the custom of isolating them makes it hard to see *why* postpositions or prepositions go with pre- and postposed modifiers, namely that adpositions are relational terms and therefore come *between* the content terms they relate, so that they are postpositions in modifier-first and prepositions in modifier-last typologies. The same is true of the ordering of genitive markers.

⁸ This seems to be a novel interpretation, but Aristotle anticipated it in using interrogative phrases to define his categories, which were to figure centrally in medieval syntactic theory.

⁹ We use French where English word order does not (yet?) conform to the otherwise general modifier-last pattern.