

Rhythm and the Synthetic Drift of Munda*

PATRICIA DONEGAN and DAVID STAMPE

*imələmlən Stanley H. Starosta-n əsənensenasən, 1939–2002*¹

1. The Structural Divergence of Munda and Mon-Khmer

The South Asian (Munda) and South-East Asian (Mon-Khmer) branches of the Austroasiatic language family² are perhaps the most divergent in the world. They are opposite in structure at every level (Table 1):

Table 1. *Polarizations in Munda vs Mon-Khmer discussed in this paper.*³

	Munda	Mon-Khmer	§§
Grammar:	Synthetic	Analytic	3, 8
Word Order:	Head-last: OV, Postpos.	Head-first: VO, Prepos.	3, 8
Phrases:	Falling (initial)	Rising (final)	4
Words:	Falling (trochaic)	Rising (iambic/monosyll.)	5, 8
Affixation:	Pre/ infixing, Suffixing	Pre/ infixing or Isolating	5
Timing:	Isosyllabic/Isomoric	Isoaccentual	5–8
Fusion:	Agglutinative	Fusional	7.1
Syllables:	(C)V(C)	(C(ə)) + (C)V(:/Y)(C)	7.1
Consonants:	Stable/Assimilative	Shifting/Dissimilative	7.2
Tonality:	Level (rare)	Contour (common)	7.3
Vowels:	Harmonizing/Stable	Reducing/Diphthongizing	7.4

In Sora,⁴ a Koraput Munda language of Orissa, the sentence ‘He doesn’t want to give me the rice’ is head-last and synthetic, as in (1), but in Khmer⁵ (Cambodian), it is head-first and analytic, as in (2):

- (1) Sora: *anin dɔŋ- nɛn darəj -ən ə- tiy -ben idsim*
 he/she OBJ- me rice -ART INF- give -INF want
-tɛ ted
 -3PR not
- (2) Khmer: *kɔət ?ət caŋ ?aoy baay kɲom*
 he/she not want give rice me

The polarity of Munda vs Mon-Khmer recalls that of ancient vs modern Indo-European: synthetic head-last vs analytic head-first (Lehmann 1974). But Munda and Mon-Khmer are far more divergent. Indo-European was never *polysynthetic*, but many Munda languages are. For example, in Sora an even more synthetic (and more idiomatic) rendering of sentence (1) crystallizes it into a single complex word *ədməltiydarɪndæ*:

- (3) Sora: *əd- məl- tiy -dar -ɪŋ -da -e*
 not- want- give -rice -me -AUX -3PR

And while all modern Indo-European languages, even English, retain some inflection, most Mon-Khmer languages lack it entirely, and Vietnamese-Muong lacks affixation entirely. The Munda and Mon-Khmer branches of Austroasiatic, rarely studied by typologists, provide a nearly exhaustive inventory of the extremes of difference in human language structure.

2. The Structural Oppositions of South Asia and South-East Asia

The main reason for the neglect of the Munda and Mon-Khmer divergence is that each is spoken in a linguistic area (*Sprachbund*) where its structure is sufficiently typical as to seem unremarkable.⁶ Most of the Munda traits in Table 1 are found also in the other language families of the South Asian area—Dravidian, Indo-Aryan, and Tibeto-Burman, as well as isolates like Nihali and Burushaski. And most of the Mon-Khmer traits in Table 1 are found also in the other language families of the mainland South-East Asian area—Tai-Kadai, Hmong-Mien, Chamic (Austronesian), and Chinese.

In some respects Munda and Mon-Khmer are not typical of their areas. For example, South Asian languages are predominantly suffixing (and Dravidian exclusively so), but Munda languages are also prefixing and infixing:

- (4) Sora: *ə- ədn- əl- gə{b}rɔj- -l -ay*
 PL- not- RECIP- {CAUS} feel-ashamed -PA -1st
 ‘We (exclusive) didn’t shame each other’

And South-East Asian languages are prefixing or isolating, but Nicobarese is also suffixing. However, in most respects Munda and Mon-Khmer are more like the unrelated languages of their areas than they are like each other. Most of the boundary lines between major typological differences in Asia in the maps in Masica (1976) run precisely between South and South-East Asia. Except in groups that have crossed over that boundary in the past two millennia, there has been deep and divergent coalescence in the respective areas.

Areal contact certainly might explain the similarities within each area. But it cannot explain the differences between them. And Munda and Mon-Khmer, and the South and South-East Asia areas, are not just *different* from each other, they are systematically *opposite* at every level. To explain the holistic polarization of structures in Munda vs Mon-Khmer, and in South vs South-East Asia, we seek a linguistic opposition which might pervade and organize every level from syntax to phonetics. The only plausible candidate is *initial vs final accent* in phrases and in words. We will speak of these as *falling vs rising rhythms*.

Munda and other South Asian languages have falling phrase rhythms (as in *noun + postposition*) and, excepting some Indo-Aryan languages, also falling word rhythms (as in *base-suffix*). Mon-Khmer and other South-East Asian languages have rising phrase rhythms (as in *preposition + noun*) and rising word rhythms (as in *prefix-base*).

We will argue that this opposition of falling vs rising rhythm is what maintains the opposition of South Asian vs South-East Asian structure, and that it was a change from a rising rhythm in proto-Austroasiatic (which we will show originally had a rising rhythm and analytic typology) to a falling rhythm in proto-Munda that channeled the drift of the individual Munda languages as their highly synthetic structures evolved.

3. Historical Issues

Grierson, in the introduction to the *Linguistic Survey of India*, at first doubted whether languages with such an opposite “order of ideas” as Munda and Mon-Khmer could be related at all (1904: 2). Schmidt (1906) established their genetic relationship, and Pinnow (1959 et passim) has removed all reasonable doubts. But there remain disagreements about what proto-Austroasiatic was like, and therefore about how the polar opposition of Munda and the eastern Austroasiatic languages came about.

3.1. *The analytic basis of proto-Austroasiatic*

Pinnow argued that proto-Austroasiatic had SVO order, based on the order of elements in the Munda verb (1960, 1966). Repeating our own examples (sentences 1, 3, 2, respectively), the Sora verb phrase is head-last:

- (5) Sora: *anin dəŋ-ŋen darəj -ən ə- tiy -ben idsim -te*
 he/she OBJ- me rice -ART INF- give -INF want -3PR
 me rice **give** **want**
ted
 not
not

The head-last order of non-inflectional elements (bold-faced) in the Sora verb phrase (5) is the exact opposite of their head-first order in the Sora polysynthetic *verb* in (6) and their head-first order in the Khmer *verb phrase* in (7). The glosses apply to both (6) and (7):

(6) Sora: (anin) əd- məl- tiy -dar -ɨn -da -e
 he not want give rice me -AUX -3PR

(7) Khmer: kǒət ʔətcaŋ ʔaoy baay kɲom

Not surprisingly for languages separated for many millenia, there is but one cognate *form* in (6) and (7): the Sora prefix əd- and the Khmer verb ʔət (lit. ‘lack’), from proto-Austroasiatic *ət. But the *patterns* of (6) and (7) are cognate: the analytic Mon-Khmer pattern of the *verb phrase* in Khmer (7), ʔət caŋ ʔaoy baay kɲom, has crystallized into the polysynthetic Munda pattern of the *verb stem* in Sora (6), əd-məl-tiy-dar-ɨn-.

From cognate patterns like these in Munda and Mon-Khmer, Pinnow concluded that proto-Austroasiatic must originally have had the analytic subject–verb–object (SVO) pattern that persists in Mon-Khmer syntax and in Munda morphology. Lehmann, in an article (1973) that extended the notion “VO/OV” to mean head-first/head-last order in other phrases, also extended Pinnow’s conclusion about proto-Austroasiatic to other phrases:

If we examine further evidence provided by Pinnow, we note that Munda contains VO characteristics. It has VO order in compounds (Pinnow [1960], 97); it also provides examples of NG [noun–genitive] order and of prefixes. Since the Khmer-Nicobar languages are consistently VO, I assume that it was the Munda languages which were modified syntactically. . . . We may conclude that Proto-Austro-Asiatic was VO and non-agglutinative in morphological structure. (Lehmann, 1973: 57)

Sora is particularly rich in examples of such “VO” (head-first) survivals:

- (8) Noun–genitive compounds: head-first with first and second person pronouns: siʔiŋ₁-jɛn₂ ‘my₂ house₁’; mǒʔɔd₁-nəm₂ ‘your₂ eye₁’; gǒrjaŋ₁-lɛn₂ ‘our₂ village₁’; oα₁-yəŋ₂-ben₃ ‘your (pl.)₃ parents (lit. father₁-mother₂)’.
- (9) Noun–noun compounds: head-first is recessive but is still regular for many nouns: kǒykǒy₁-im₂ ‘chicken₂ tail-plume₁’; əsiŋ₁-dǒd₂ ‘snail₂ shell (lit. house₁)’; əsɔŋ₁-taŋ₂ ‘cow₂ dung₁’; əloŋ₁-siŋ₂ ‘interior₁ of a house₂’; əbaγ₁-mǒd₂ ‘pupil (lit. seed₁) of the eye₂’.
- (10) Verb–object (object incorporated) compounds, all head-first: ə₁-si₂ ‘wash₁ the hand₂s’; ə₁-jɛn₂ ‘wash₁ the feet₂’; gǒ₁-ə₂ ‘erect₁ a

funeral stone₂’; *gʷi-siŋ*₂ ‘erect₁ a house₂’; *gəd₁-bir*₂ ‘clear (lit. cut₁) a hill₂ for shifting cultivation’; *gəd₁-bəŋ*₂ ‘sacrifice (lit. cut₁) a buffalo₂’; *gay₁-saŋ*₂ ‘dig₁ turmeric-root₂’; *gay₁-loŋ*₂ ‘dig₁ a pit₂’; *jom₁-dar*₂ ‘feast (lit. eat₁ rice₂)’. Similarly the reflexive is head-first: *gəd₁-dəm*₂ ‘cut₁ oneself₂’; *ə₁-si₂-dəm*₃ ‘wash₁ one’s own₃ hand₂’.

- (11) Other verb–dependent compounds, also all head-first: (agent) *jəm₁-kid*₂ ‘be caught₁ by a tiger₂’; *mə₁-kol*₂- ‘be swallowed₁ by a ghost₂’; *duŋ₁-yoŋ*₂ ‘for the sun₂ to rise₁’; (instrument) *rəj₁-kon*₂- ‘chop₁ with a knife₂’, *ti₁-daŋ*₂ ‘beat₁ with a stick₂’; (locative) *dək₁-siŋ*₂ ‘stay₁ at home₂’; (completive) *jom₁-aŋ*₂ ‘eat₁ up₂’.
- (12) Auxiliary–verb compounds, also all head-first: *yər₁-mēŋ*₂ ‘revive, lit. return₁-live₂’; *məl₁-gij*₂ ‘want₁ to see₂’; *rəbt₁-əmdəŋ*₂ ‘can₁ hear₂’. (But like all phrases in Sora, auxiliary *phrases* are head-last, e.g. *raʔa₁-n₂ ə₃-gij₄-ben₃ ə₅-rəbt₆-l₇-ε₈ pəʔ?* ‘Were₇ you₈ (PL₅) able₆ to₃ see₄ the₂ elephant₁?’.)

The shapes of the elements in the Sora compounds in (8) through (12) echo the bare and often monosyllabic shapes of independent words in Mon-Khmer, and their head-first internal order echoes the order of phrases and compounds in Mon-Khmer. All this, together with the striking rarity of head-last order in Mon-Khmer, supports Lehmann’s conclusion that proto-Austroasiatic syntax was head-first not only in the predicate (VO) but in phrases generally.

Both Pinnow’s and Lehmann’s conclusions rest on an implicit but well-tested hypothesis that syntactic patterns become morphological patterns, but morphological patterns do not become syntactic patterns.⁷ An original proto-Austroasiatic head-first syntactic pattern, maintained in Mon-Khmer, has become a head-first morphological pattern in the Munda polysynthetic verb. The converse change—dissolving a polysynthetic word like Sora *əd-məl-tiy-dar-ij-* (6) into an analytic phrase like Khmer *ʔət caŋ ʔaoy baay kɲom* (7)—seems quite impossible. Clearly, it is Munda that innovated, first by joining proto-Austroasiatic head-first analytic phrases (7) into head-first polysynthetic words (6), a process paralleled also in a few other Austroasiatic languages like Nicobarese, and then, along with a reversal from rising to falling rhythm, by reversing head-first analytic phrases into head-last inflected phrases (5).

Despite his own evidence for SVO structure in proto-Austroasiatic, Pinnow (1960) hypothesized that proto-Austroasiatic might have been synthetic, on the basis of variation in Khmer word-final consonants that he took as evidence for former suffixes. But Jacob (1992), citing extensive Khmer data, showed that this consonant variation is not grammatical but

affective, and that it involves not only final but also initial consonants and even vowels. Such affective variation is widespread in Mon-Khmer (see Jacob's list of references, 1992: 71) and in Munda (Kuiper 1965).

More recently, Zide and Anderson (2001) have assembled cognates in various eastern Austroasiatic languages for a number of verbal formatives in the Munda languages. They take many of these not only to have been part of proto-Munda but also of proto-Austroasiatic. Some are derivational prefixes or infixes of nominalization, causativization, and so on, that have long been accepted as proto-Austroasiatic. Others are inflectional elements like person and number affixes, tense/aspect affixes, and so on, which were also reconstructed by Pinnow in his work on the Munda pronouns (1965) and the verb (1966). Zide and Anderson's work on these incorporates South Munda data that provide a much clearer view of early Munda than was available to Pinnow. They criticize Donegan and Stampe (1983) for the view that the Munda morphology must be seen as in large part due to the independent synthetic drift of the daughter languages rather than due to the breakdown of a fully formed verbal system in proto-Munda. Our views are based not on some a priori scepticism about reconstruction, but on the difficulty of explaining the variety of combinations of elements of the verb in the daughter languages if those elements were already affixes rather than free forms in proto-Munda. At the level of proto-Austroasiatic the difficulty is far greater, because in the vast majority of eastern languages the cognate elements are free forms. To reconstruct synthetic morphology for proto-Austroasiatic implies that the vast majority of eastern languages lost verbal inflection and morphology and became analytic.⁸ But that would entail that in most Mon-Khmer languages that former affixes—elements characteristically faded in pronunciation, grammatical autonomy, and meaning—have been restored to full lexical specificity and function. It is far more likely that Munda and the few eastern languages that show some signs of synthesis have innovated it. The reason is that most of the elements that are functionally identical, whether cognate or not, are placed at one end of the verb in Munda and at the other end the eastern languages. The only obvious explanation for that is that those elements were still free forms that could trade places with the verb after Munda changed from head-first and prefixing to head-last and suffixing.

3.2. *Syntax: Progression vs regression*⁹

There is an old view that languages naturally change from synthetic to analytic, but that the opposite change, if it were to occur at all, would have to be due to external causes. The same scepticism has extended to changes from head-first to head-last order.

Friedrich von Schlegel (1808) contrasted the “ancient and artful” forms of Sanskrit, Greek, and Latin, which expressed structure morphologically, by affixing or modifying a root, with the younger Romance or English, which expressed structure by adding separate words like auxiliaries and prepositions. The general tendency for languages to change from synthetic to analytic “shows up everywhere the same”, Schlegel said; “no external cause is necessary”:

The ingenious structure is readily lost through wearing away by common usage, . . . and the grammar with auxiliaries and prepositions is actually the shortest and most convenient, like an abbreviation for simple, general usage; in fact one could almost establish the general rule that a language is the easier to learn, the more its structure has been simplified and approximated to this abbreviation (translation by Lehmann 1967: 26).

Jespersen (1922: chapters 18–20) concurred, arguing that the change from synthetic to analytic is not “decay” but “progress”:

(1) The forms are generally shorter. . . . (2) There are not so many of them to burden the memory. (3) Their formation is much more regular. (4) Their syntactic use also presents far fewer irregularities. (5) Their more analytic and abstract character facilitates expression by rendering possible a great many combinations and constructions which were formerly impossible or unidiomatic. (6) The clumsy repetitions known under the name of concord have become superfluous. (7) A clear and unambiguous understanding is secured through a regular word order. . . . This development may truly . . . be termed a progressive evolution (1922: 364).

The implication is clear: that an opposite change from analytic to synthetic would be regressive, and would occur only due to some external cause.

The typological classification of languages as head-last vs head-first has come to be treated as an even more basic “parameter” of grammar than analytic vs synthetic. Roughly half the world’s languages are of each type. From a purely logical view of grammar, there is no reason to regard one as more natural than the other. But Yngve (1960) argued that left-branching (head-last) structure puts a burden on short-term memory and that many transformations function to reduce left-branching. Chomsky (1965: 197–198) quarreled with this, but neither he nor Yngve observed that head-last structure seems to require synthesis. As Greenberg (1963: 96) put it, “if in a language the verb follows both the nominal subject and nominal object as the dominant order, the language almost always has a case system”—as in Dravidian and Indo-Aryan. And if not a case system, we could add, then subject and object marking on the verb, as in Munda. There is rarely such marking either of nouns or verbs in Mon-Khmer and other languages of South-East Asia, where the verb precedes the object.

Also, head-last sentences seem uncomfortable with more than one finite verb. Clauses that head-first sentences comfortably embed often must be nominalized in head-last sentences. Head-last clauses are flattened down into phrases. In Sora and many head-last languages, a conditional clause must be nominalized and treated as the object of a postposition equivalent to the preposed subordinating conjunction *if* of head-first languages.

An explanation of these remarkable asymmetries was proposed by one Mark Twain in *The Awful German Language* (1880). Based on research “upwards of nine full weeks” (616), Twain found that a German sentence

treats of fourteen or fifteen different subjects, each enclosed in a parenthesis of its own, with here and there extra parentheses which re-enclose three or four of the minor parentheses, making pens within pens; . . . after which comes the VERB, and you find out for the first time what the man has been talking about. . . . German books are easy enough to read when you hold them before the looking-glass or stand on your head—so as to reverse the construction (Twain 1880: 603).

He provided an example of a verb-last subordinate clause, with a literal translation, and parentheses and hyphens to help the English reader:

Wenn er aber auf der Strasse der in Sammt und Seide gehüllten jetzt sehr ungenirt nach der neusten Mode gekleideten Regierungsrathin begegnet . . .

But when he, upon the street, the (in-satin-and-silk-covered-now-very-unconstrainably-after-the-newest-fashion-dressed) government counselor’s wife met”, etc., etc. (Twain 1880: 604).

“You will observe”, Twain said, “how far that verb is from the reader’s base of operations”. Putting this in terms linguists can understand, the verb is the head of its sentence, and the head of a construction can stand for the whole. In Twain’s example, the verb, *begegnet* ‘met’, singlehandedly gives us the gist of the sentence: *a meeter met a meetee*. If the verb came early, everything else would just elaborate that gist. But the verb comes last and its elaborations come first! So to make the best of a bad thing, we are given case marking to help us sort out which elaborations are which—*er* is the masculine *doer*, and *der* the feminine *doee*, etc.—until at last we get to the verb and find out *what* he did, *upon the street*, to *her*, *dressed after the latest fashion*, *the government counselor’s wife*: he met her.

Case marking or verb agreement occur in most languages, but as Mon-Khmer shows, both can be dispensed with entirely in head-first languages. Head-last order may be *logically* equal to head-first order, but if it requires synthetic structure, whatever the reason for that may be, then it is not *psychologically* equal. Elements that are compounded or affixed are altered

in form and meaning—grammaticalized or lexicalized. To say our example sentence in Khmer, (2), we only need to know the Khmer words for *he not want give rice I*. To say it in Sora, (1), we need to know not only the Sora words but also how to mark *want* for tense, person, number, and other things that we won't even mention, what ambifix to wrap around *give* to show that it isn't the head verb, whether *rice* needs an article, and how to show that *I* isn't the subject. It is hardly surprising that a change from head-last to head-first order and synthetic to analytic structure could be viewed as progress, but that a change from head-first to head-last order, and from analytic to synthetic structure, could be viewed as regression—something that would happen only under outside influence.

3.3. *Outside influence?*

Scepticism about whether a 'natural' or 'internal' drift could be toward head-last and synthetic structure accords with the persistent view that this structure in common Munda arose due to areal influence—Dravidian rather than Indo-Aryan influence, given the relatively late date of Indo-Aryan settlement in the subcontinent. It is still customary to assume that areal similarities that do not have a genetic basis must be due to areal contact.

This assumption resulted in classifications of languages as "mixed" in the South-East Asian as well as the South Asian area. In particular, Vietnamese was thought to be mixed until Haudricourt (1954) showed that its tones were not derived from Thai or Chinese but arose by rephonologization of the phonation types of its inherited Austroasiatic consonants.

Sora was labeled mixed until the appearance of Ramamurti's grammar (1931), which brought him a letter from Edward Sapir, saying, in part:

I note from the references to Savara in recent general linguistic surveys by Kieckers, by Meillet and Cohen and by Father Schmidt that Savara is classified as a mixed Mundā language, owing to supposed serious influence exerted by Aryan and Dravidian. I gather from what you say that the language is quite definitely of the Mundā type and is to be classified without reservation with such typical Mundā languages as Santāli. (Letter quoted in an advertisement in Ramamurti 1933: 259–260)

The classifications of Sora to which Sapir referred¹⁰ all simply echoed the statement by Konow in his Munda and Dravidian volume of the *Linguistic Survey of India* that "Savara has been largely influenced by Telugu and is no longer an unmixed speech" (1906: 218). Konow says that all he knows of Sora was gleaned from the texts submitted to the *Survey*, but there is nothing Telugu in those texts. Konow had some knowledge of Santali and

other North Munda languages, and apparently, wherever Sora seemed to differ from them, he simply assumed it was due to non-Munda influence.

But while Santali is “typical” of Munda languages in having assimilated every phoneme of a neighboring Indo-Aryan language, Sora alone has *no* foreign phonemes. Santali and most Munda languages have adopted much vocabulary from neighboring non-Munda languages (Pinnow estimates that Khar̥ia has 40 per cent Indo-Aryan words). And they have adopted grammatical processes and constructions along with them. But Sora has adopted only one, the Indo-Aryan flexional *-o/-i* of Oṛiya for naming males/females, as in *tabəno/tabəni*, a man/woman called ‘bamboo shoot’ (*tabəŋ*), or *gəd-sər-ganə/-gani*, a man/woman born in *gəd₁-sər₂-gaj₃* ‘cut₁-rice₂-moon₃’.

Finally, speakers of most Munda languages also speak a local non-Munda language, and some speakers of the less populous languages use their mother tongues only in private. For example, Das Gupta (1978: 4) could find no monolingual Juangs at all. But among Hill Soras, inquiries during our 1980’s field work about how many know any language besides Sora were answered not with numbers but with names. Hill Soras expect to be spoken to in Sora, and do their trading via agents bilingual in Sora and Oṛiya (Vitebsky 1993).

But not only Sora but *all* Munda languages, despite the recent influence of non-Munda languages, remain solidly Munda in their basic structures. Despite foreign phonemes, they have kept native phonemes and processes intact. Though most languages have lost the central vowel series of proto-Munda, these vowels are retained in Sora, and they are reconstructible at every branch in the Munda family tree (see section 7.4). As for consonants, Munda languages retain the treatment of final stops as checked and voiceless but morphophonemically voiced (see section 7.3)—even Khar̥ia and the North Munda languages, which have added the full complement of released final stops (e.g. *p ph b bh*) from Indo-Aryan.

As to an ancient influence of Indo-Aryan or Dravidian on Munda, no convincing evidence has been presented to support the theory that Munda synthesis and head-last order were borrowed. Even in vocabulary, few Indo-Aryan or Dravidian words appear in a form in Munda languages that would indicate ancient borrowing.¹¹ And the converse is true as well: Few of Kuiper’s *Proto-Munda Words in Sanskrit* (1948), for example, have turned out to be proto-Munda, and only a handful of words in the large etymological dictionaries of Indo-Aryan by Turner (1966) or of Dravidian by Burrow and Emeneau (1984) seem likely to turn out to be Munda.¹²

As for grammatical form, though Munda is head-last and synthetic like Indo-Aryan and Dravidian, it differs from them in a way which Nichols (1986, 1992) has argued is more resistant to change than is word order.

Indo-Aryan and Dravidian languages are mainly *dependent-marking*, marking noun phrases for their case relation to their verbal head. The Munda languages are mainly *head-marking*, marking verbal heads for their relation to their noun phrase arguments. Most Mon-Khmer languages mark neither. The hypothesis of a Dravidian substratum would imply something that seems unimaginable: that dependent-marking speakers adopted a noninflecting language and made it head-marking.¹³

Sapir said, “Language is probably the most self-contained, the most massively resistant of all social phenomena; it is easier to kill it off than to disintegrate its individual form” (1921: 220). Indeed, the impact of Indo-Aryan and Dravidian languages on Munda languages has been less to *change* them than to *replace* them. Munda languages were once spoken over much of India—see Elwin’s summary (1955: chapter 1) of ancient Indic and Greek references to *Śabara* or *Savara* or *Suari*—but most of that vast area is now Indo-Aryan or Dravidian-speaking.

But death is not diffusion. There is little solid evidence of assimilation of early Munda to Indo-Aryan or Dravidian, or the reverse. Languages of India share traits like those in the Munda column of Table 1, but so do head-last languages everywhere. These and many other traits Indologists have regarded as areal were shown by Masica (1976) to extend over central and northern Eurasia, as well as to occur in geographically remote areas. Munda languages have been seen as genetically related not only to Mon-Khmer, but also Dravidian, Tibeto-Burman, Burushaski, Nihali, Vedda, and geographically remote head-last languages like Finno-Ugric, Turkic, Australian, Basque, and Japanese, by linguists who found deep similarities in Munda.¹⁴ Such comparisons have been ridiculed when the similarities proved not to be inherited nor diffused, but they deserve some explanation.

The structures of languages are not just inherited or borrowed, they are also shaped to the needs of their speakers and hearers, and of those needs, two are inseparable: first, a consistent grammatical form, and second, a consistent rhythmic scaffolding for realizing that form in utterances that must be constructed, communicated, and comprehended in real time.

4. Falling and Rising Rhythm

“Finding a way into a conversation”, said Tannen (1994: 18), “is like joining a line of dancers”. Speaking and listening, and all regular voluntary action, in ensemble or solo, outwardly or in imagination, is performed and perceived to a tacit real time rhythmic score. Knowing a language is not just a knowledge of words and constructions and propositions, it is also the ability to hear and speak them as beats and phrases and melodies.¹⁵

that request a dependent for a known head, e.g. *Which_D book_H?—The brown_D book_H*. But there are no interrogative pronouns that request a head for a known dependent, e.g. **What_H brown_D?—The brown_D book_H*. As is shown in Table 2, in every phrase type, the head corresponds to old information and the dependents to new information, but not the reverse, in a potential question and answer.¹⁶

Table 2. *Question words correspond to dependents (in bold), not heads.*

[V O]	<i>She [got a book].</i>	<i>What did she get? *WH-Verb she a book?</i>	<i>A book. *Got it.</i>
[V Adv]	<i>He [speaks clearly].</i>	<i>How does he speak? *WH-Verb he clearly?</i>	<i>Clearly. *Speaks.</i>
[Mod V]	<i>He [can type].</i>	<i>What can he do? *WH-Modal he type?</i>	<i>Type. *Can.</i>
[Prep N]	<i>[from there]</i>	<i>Where from? *WH-Prep there?</i>	<i>There. *From.</i>
[N Rel]	<i>The [book that we lost].</i>	<i>Which books? *What that we lost?</i>	<i>The ones we lost. *The books.</i>
[N Gen]	<i>A [book of John's].</i>	<i>Whose book? *What of John's?</i>	<i>John's. *A book.</i>

The dependent also gets the main beat (accent) relative to the head. This is true not only if it is newer information than the head, as in answering the questions of Table 2, but also if the head and the dependent are both old or both new, as in *We didn't read_H a 'book_D, we baked_H a 'cake_D*. The usual *situation* has been conventionalized as the usual *rhythm*: modern English has a rising rhythm, and most dependents have moved to the phrase-final beat.¹⁷ Where the ancient dependent-first word order has not shifted to dependent-last, as in English [Adj_D N_H] *red_D books_H* (cf. French [N_H Adj_D] *livres_H rouges_D*), there is a discrepancy: if the dependent is newer than the head, it steals the main beat from the end of the phrase: *'red_D books_H*. But if there is no contrast in newness, the default English phrase-last rhythm is dominant: *red_D 'books_H*.

4.2. *Munda vs Mon-Khmer heads and dependents*

In section 3.1 we showed that Munda morphology has the same head-first order of elements in Mon-Khmer syntax, that proto-Austroasiatic must have had head-first syntax, and that Munda must have shifted its syntax

from head-first to head-last. In Table 3 we contrast Munda and Mon-Khmer order in various phrase types, showing how their opposite word orders reflect their opposite phrase rhythms. In either rhythm, dependents go on the main beat, so that in Munda with its falling phrase rhythm there is a dependent–head phrase order, while in Mon-Khmer with its rising phrase rhythm, there is a head–dependent phrase order.

Table 3. *Opposite order in Munda vs Mon-Khmer: ['] marks dependents.*¹⁸

	Munda (Sora)	Mon-Khmer (Khmer)
reads ₁ the book ₂	['O V] <i>kəmbəl₂-ən ken-əl₁-t-ε</i>	[V 'O] <i>məəl₁ siəwphiw₂</i>
gives ₁ the book ₂ to me ₃	['Dat ['O V]] <i>dəŋ-ŋən₃ kəmbəl₂-ən tiy₁-t-ε</i>	[[V 'O] 'Dat] <i>qəoy₁ siəwphiw₂ kħnom₃</i>
goes ₁ quickly ₂	['Adv V] <i>omeŋ₂ yer₁-t-ε</i>	[V 'Adv] <i>tiw₁ rəhah₂</i>
stays ₁ in ₂ the house ₃	['[N Adpos] V] <i>si?iŋ₃-leŋ₂-ən dəko₁-t-en</i>	[V '[Adpos 'N]] <i>niv₁ knoŋ₂ pteəh₃</i>
very ₁ small ₂ house ₃	['[Adv Adj] N] <i>bəybəy₁ sənna₂ si?iŋ₃-ən</i>	[N '[Adj 'Adv]] <i>pteəh₃ tooc₂ nah₁</i>
grandfather ₁ 's ₂ house ₃	['Gen N] <i>jojo₁-n ə₂-si?iŋ₃-ən</i>	[N 'Gen] <i>pteəh₃ taa₁</i>
the book ₁ which ₅ is ₂ in ₃ the house ₄	['Rel N] <i>ə₅-si?iŋ₄-leŋ₃-ən dəko₁- t-en-ən₅ kəmbəl₁-ən</i>	[N 'Rel] <i>siəwphiw₁ niv₂ knoŋ₃ pteəh₄</i>

Reversals of rhythm and word order, as in Indo-European and in Munda, are not very common in the world's languages. Niger-Congo (Givón 1975) had a progressive shift like Indo-European—falling to rising and head-last to head-first. Tibeto-Burman, given the prefixing character of proto-Sino-Tibetan (Benedict 1972), may have had a regressive shift like Munda—rising to falling and head-first to head-last. A regressive shift entails the construction of an inflectional system (section 3.3), and surely takes far longer than a progressive shift. Judging from the time depth of the far less complete reversal of type in Indo-European, Munda must have a time depth of several millenia.

The recorded histories of Indo-European languages show that reversals of grammatical structure proceed gradually, construction by construction,

hinging on local analogies and ambiguities. Even where we can find the grammatical function of a given change, it is often clear that alternative changes were available. To understand why local changes taking many generations can result in a consistent global reversal of word order requires a factor both persistent and pervasive, namely a reversal of phrase rhythm.

5. Phrase Rhythm and Word Rhythm

Munda and most South Asian languages, with falling phrase rhythm, also have falling word rhythm, while Mon-Khmer and most South-East Asian languages, with rising phrase rhythm, also have rising word rhythm. Some languages with falling phrase rhythm (and head-last order) are described as having word-final accent, for example the Turkic languages, but those we have heard put the beginning of the word on the beat, and the “accent” that is described is merely a terminal rise in pitch. Korean has a rather similar rhythmic system.

“Accent” usually coincides with the beat, but in some languages it has no rhythmic relevance whatever. For example, the pitch accents of Vedic or Homeric Greek or of Japanese seem to play no role in the rhythm even of their verse. By falling and rising word rhythm we refer only to whether the beginnings or ends of words come on the rhythmic beats, even if this does not coincide with other “accents” in the language.

Just as falling and rising phrase rhythms do not necessarily put the very first or last word of a phrase on the beat, word rhythms do not necessarily put the very first or last syllable of a word on the beat. Some languages skip an initial or final syllable, particularly prefixes or suffixes.

And even if only a root or stem is eligible, its very first or last syllable may not be. Beats are not pulses but divisions of time, sufficient for a long syllable (like English *'stead* ♩) or two or perhaps three short syllables (*'steady* ♪♪ or *'steadier* ♪♪♪, the latter spoken as a triplet) of which the first is the most prominent. We use English examples here because our readers will know the rhythm of English, and because these examples were carefully measured by Lehiste, who found that they are spoken isochronously by “temporal compensation” of their syllables (1971, 1977). A stress accent, as in English, foregrounds a stressed syllable by lengthening it at the expense of unstressed syllables. To use more precise notation, *'stead*, *'steady*, *'steadier* take a dotted rhythm, ♩, ♪♪, ♪♪♪ respectively. The duration of any syllable varies inversely with the durations of the other syllables in the beat. This was a structural fact of early English, where long vowels shortened phonemically before two syllables in the same beat (*'sāne* : *'sānity*), and both vowels shortened in two-beat compounds that were reduced to one beat (*'waist,coat* : *'weskit*). Beats and syllables are not only the domains

of timing but also they and their natural parts (beginning, rise, peak, fall, end) are the domains of phonological processing (Donegan and Stampe 1978). For example, sonorant nasalization is limited in English to one beat (*de^llɪr.ɪ.ũm*) or even just one syllable (*de^llir.i.ũm*).

In many languages a short anacrustic syllable may be prefixed to the beat, like a musical grace note, as in *in^lstead* ♪♩. Like a grace note, such an anacrustic syllable is temporally inert: it is not part of the following or the preceding beat, and its presence does not perceptibly shorten nor does its absence lengthen the following or preceding syllables. It is the “rhyme” of a word that determines its timing, from the most prominent syllabic to the end of the word. Mappings of words and phrases onto beats or measures may be iambic, like the word *in^lstead*, or the verse line *|and^lmiles| to^lgo| be^lfore| I^lsleep|*, but as in western music notation, the beats and measures of the rhythmic score itself are always front-prominent.¹⁹

To fit into a beat, which is universally bimoric, the word should begin either with two light syllables like Sora *'ura* ♪♩ ‘mango’ or one heavy like *'yəŋ* ♪ ‘mother’ or *'sɪn.dɪ* ♪♩ ‘date palm’. In a word consisting of a light plus a heavy syllable, the light syllable is ignored: Sora *ɛ^l?ɛl* ♪♩ ‘ironwood’, *tə^lrɪb* ♪♩ ‘cloud’, which is rhythmically equivalent to eliminating the short syllable, *trɪb* ♪.²⁰

Mon-Khmer and other mainland South-East Asian languages put the word-final syllable on the beat. To fit the bimoric duration of the beat, short-voweled open final syllables may be extended either by lengthening the vowel or by closing it with a glottal stop.²¹

5.1. *Word rhythm and compound structure*

The accentuation of compounds also exemplifies the principle that heads are rhythmically subordinate to modifiers. Mon-Khmer compound nouns are head-first, with a rising rhythm as in Mon-Khmer phrases and words:

- (14) Khmer: *ˌsac* - *ˈmoəŋ* *ˌbaay* - *ˈprɪk* *ˌlaan* - *ˈcnuəl*
 flesh - chicken food - morning car - hire
 ‘chicken meat’ ‘breakfast’ ‘rental car’

In Munda, the picture is more complex. Sora, for example, has three patterns of compounds. There is a productive pattern exactly opposite the Mon-Khmer pattern:

- (15) Sora: *ˈkənsim* - *ˌjɛl* *ˈəbəb* - *ˌsu* *ˈkənsim* - *ˌsəŋ*
 chicken - flesh head - pain chicken - feces
 ‘chicken meat’ ‘headache’ ‘chicken manure’

But head-last compounds are fairly recent in Munda. Older compounds, such as Sora $\text{\textit{adr}\textit{\epsilon}_1\textit{-im}_2}$ ‘chicken egg (lit. egg₁-chicken₂)’ or $\text{\textit{k}\textit{ambol}_1\textit{-si}_2}$ ‘biceps muscle (lit. rat₁-arm₂)’ have head-first structure like those of Mon-Khmer. The Munda falling rhythmic pattern has been imposed even on these older compounds— $\text{\textit{'}\textit{adr}\textit{\epsilon}\textit{-im}}$, $\text{\textit{'}\textit{k}\textit{ambol}\textit{-si}}$ —so that the rhythm no longer fits the old head-modifier order.

In the formation of Sora verb stems, however, the rising rhythm is still intact, and the head-first structure still remains productive, e.g. $\text{\textit{g}\textit{ad}_1\textit{-'}\textit{im}_2}$ ‘sacrifice a/the chicken’ (lit. cut₁-chicken₂). This is in contrast with the less idiomatic expression of this in separate words: $\text{\textit{'}\textit{k}\textit{ansim}_2\textit{-}\textit{\textit{\textit{a}}\textit{n}_3}\textit{g}\textit{ad}_1\textit{-}}$ (lit. ‘chicken₂ ART₃ cut₁’), which must be head-last.

5.2. *Word rhythm and affixation*

Most Mon-Khmer languages, like other South-East Asian languages, lack suffixes entirely; only prefixes and infixes occur. Munda languages have some prefixes and infixes, but many more suffixes. The suffixes are not reconstructable as suffixes to proto-Austroasiatic, and only a minority of them reconstruct as suffixes even to proto-Munda. So suffixation must have been an ongoing tendency in Munda languages. This has often been attributed to contact with the suffixing Dravidian languages, but the Munda suffixes are not borrowings or even calques of Dravidian suffixes.

Instead, prefixation vs suffixation reflects rising vs falling word rhythm. Exclusively prefixing languages, like the languages of South-East Asia, have rising word rhythms. Exclusively suffixing languages, like Dravidian, Finnic, and Turkic, have falling word rhythms. The reason must be to background affixes by putting them at the far end of the word from the beat. Rising rhythm backgrounds prefixes; falling rhythm backgrounds suffixes. In Mon-Khmer, new affixes are prefixed; in Munda, they are suffixed.

6. **Timing**

It should be clear from Table 1 that it is not only grammatical traits that are opposite in Munda and Mon-Khmer and their areas; phonological traits are opposite, as well. We are not referring here to phoneme inventories and morphophonological alternations, but to the living prosodic and featural processes that distinguish and polarize the two language areas, and to the word forms that result. The rhythmic type of a language is a pervasive influence in its living phonology, and since phonological processes apply to rhythmic domains, they are strongly linked.

In our 1983 paper, we attributed the divergent phonological typologies of Munda and Mon-Khmer to Munda’s syllable rhythm (isosyllabic or

isomeric, depending on whether short and long syllables are distinguished) and falling accent, versus Mon-Khmer's word rhythm (isoaccentual, in bimoric beats) and rising accent. But just as all speakers have the same phonetically motivated processes, but must inhibit them differently to speak different languages, so too all speakers are motivated to give moras equal time, and syllables, and words, but they are forced by the structure of their languages to yield on one or more of the principles.

In monosyllabic languages like those of the Vietnamese-Muong group, the rhythmic principles do not conflict: each simple word is one syllable, and each syllable is heavy, so that any sequence of words is a sequence of bimoric beats. But there are two conditions on this kind of word-perfect rhythm: First, there should be hiatus at word boundaries: languages with liaison do not keep words rhythmically discrete and thus tend to time by moras (Greek, Latin) or syllables (Italian, French), not by words. Second, most words must be sufficiently short to fit into a beat: languages with front accent and multiple suffixes (Dravidian, Uralic, Altaic) have words of highly variable duration, and find it easier to time by moras or syllables.

Mon-Khmer languages, with hind accent, hiatus, short words, and no suffixes, can have word timing. Munda languages, with front accent and a great accumulation of suffixes, must live with syllable or mora timing. These differences, as is evident to the ear of any traveler, are true also of the distinct linguistic areas where Munda and Mon-Khmer are spoken.

7. Rhythm and Phonology

Real-time rhythm is as central to phonology as it is to syntax. Beats and measures are the domains into which speech material is fitted, and they are the domains to which the effects of phonological processes are restricted. When too little or too much material is fitted into a beat or measure, the phonological processes that the language has not inhibited apply to fill out the timing or to trim the excess. These processes create the syllable types, consonant formations, tonal patterns, and vowel inventories of languages. In this section, we will consider how the dominant rhythmic principles of each Austroasiatic branch have created opposite phonological types.

7.1. *Rhythm and syllable canon*

Proto-Austroasiatic had isochronous words of one or two syllables. The disyllable had a rising rhythm, like **bə'lu* ˩˦ 'thigh': its final syllable got a full beat, like a monosyllabic word, and could contain a full long or short vowel plus consonant, while the initial syllable, called "minor" (Shorto 1960), had only a ə-like vowel (Pinnow 1959; Shorto 1976).

In Mon-Khmer, a distinctively short vowel in the final syllable was kept short by inserting a glottal stop $bə'luʔ$, but otherwise could be merged with the corresponding long vowels $bə'lu$. The short initial syllable invites vowel reduction or deletion, and the long final syllable invites diphthongization, as in Khmer $'pliw$ ↓ ‘thigh’. Vowel deletion creates the complex initial clusters typical of Mon-Khmer, but such consonant clusters may be reduced (Khmer $slaap-'priə$ ‘spoon’ ~ $sə'piə$). Since minor syllables are non-moric, the initial consonant clusters that result from vowel deletion do not include geminates; and any consonant that is completely assimilated simply disappears, since it lacks any moric value, e.g. Khmer $pram_1-bəy_2$ ‘eight’ (lit., five₁-three₂) ~ $mbəy$. Fusions of adjacent morphemes like this favor a functional morphology, and in extreme cases, like Vietnamese, they have led to a complete loss of affixation.

In Munda, the disyllable was given a falling rhythm, $*'bəlu \text{ } \bar{\square}$, fitting the final syllable into the beat by shortening its vowel (proto-Munda seems not to have had vowel length distinctions), and giving the initial syllable a full though short vowel—often, by harmony, $'bulu$. The shift to falling accent encouraged encliticization and suffixation in Munda, e.g. Sora $'bulu_1-len_2-jj_3$ ‘our₂ thigh_{1s3}’. Word rhythm became impracticable; the languages shifted to syllabic rhythm, which because of the inherited distinction between open and closed syllables is of the isomoric variety. This rhythm supports geminate consonants in the Munda languages: a syllable-final consonant completely assimilated to an adjacent consonant retains its moric value, as in Sora $bəttəŋ$ ‘frighten’ < $bə\{b_1\}təŋ_2$ ‘cause₁ to fear₂’. Where consonants retain their presence, even if not their full identity, the morphemes of which they are part retain their separate identities, as is typical of agglutinative morphology.

7.2. Rhythm and consonants

Austroasiatic onsets had a stop voicing distinction, which was universally preserved in Munda; this conservation of phonation type in consonants seems typical for India, with only sporadic exceptions. But in Mon-Khmer and South-East Asia, consonant shifts are commonplace (Haudricourt 1965). One of the main causes of this is stress (word) timing, as also in Germanic. Also it may also be encouraged by the dissimilation of initial consonant clusters, which for reasons already explained are commonplace in Mon-Khmer (Khmer $pdou$ ‘to exchange’, $tməy$ ‘new’). Such clusters are susceptible to assimilation and if the assimilation is complete, to loss. Since assimilation favors more-similar sounds, dissimilation can block it, and such strengthenings may extend to initial consonants in general.

A prosodic characteristic of languages that is often overlooked because it is not “distinctive” is whether or not final consonants are pronounced with a vocalic release or are unreleased. This is a very important feature in the phonological typology of languages. A final release is typical of Indo-Aryan and Dravidian languages and helps preserve voicing, aspiration, and affrication in final consonants. In Oṛiya (Indo-Aryan), consonant-final words apparently were pronounced with a release that became identified with a vowel, so that Oṛiya words all end in vowels (Masica 1991: 197). In Dravidian, the final release also has created an “enunciative” vowel (Bright 1975). One result of this tendency is that released final consonants may become continuants since they are between continuants (the preceding vowel and the following release), as in Tamil, or in Europe in the lenitions of Celtic, Spanish, Danish, etc.

Austroasiatic, Sino-Tibetan, and the South-East Asian language groups pronounce final consonants without release (rather like the /t/ in English *right now*). This prevents final consonants from becoming continuant, but it eventually limits final obstruents to voiceless stops with simultaneous glottalization, and in many languages of this type it has resulted in the loss of oral articulation in some final stops, leaving only the glottal stop behind. In Mandarin this has happened to all final stops. In Munda it happens in several languages to velars, e.g. South Munda **ɔlag* ‘leaf’, Juang *olag*, but Khaṛia *ola?*, Gorum *ola?a*, Gutob *ola?* (in Sora *ɔla*, even the glottal stop was lost), etc., and in some to other positions of articulation as well, e.g. to coronals in Remo *pine?*, Gutob *pine?* ‘flute’, Gta? *pini* ‘horn’ (cf. Sora *p{əŋ}əd*, nominalization of *pəd* ‘to blow a flute’), and to labials in Gta? *gta?* ‘ethnonym’ (Gutob *gutob*), *sla?* ‘tree’ (Gutob *sulob*).

Consonant release/nonrelease is a remarkably stable feature historically. If it is related to the distinction of falling/rising rhythm, the relationship is not clear to us. None of the languages of either area seem to have switched from releasing to nonreleasing, or vice versa. We have argued elsewhere, in fact, that one very odd characteristic of Munda—that it has only *voiced* stops morpheme-finally even though word-finally they are pronounced as checked and voiceless, as in Sora *pətod* [pətoʔt] ‘a hole’ beside the form with the article [pətoð-ən]—is due to the voicing of word-final checked stops at the moment that proto-Munda first began to suffix vowel-initial suffixes. There were voiceless as well as voiced stops nonfinally, as in Sora *bətəŋ* ‘fear’ vs *pədab* ‘mushroom’, so all morpheme-final stops had to be interpreted as phonemically voiced (*b d j g*). This innovation is not found elsewhere in Austroasiatic, or apparently in the world, and it strengthens the widely held view that Munda (North and South) is indeed a single genetic family in Austroasiatic (Donegan and Stampe 2002).

7.3. *Rhythm, tone, and register*

Consonant phonations which are neutralized may have reflexes in tonal distinctions, as Haudricourt (1954) demonstrated for Vietnamese, and as others (e.g. Matisoff 1973) have observed elsewhere in South-East Asia. The tones of Mon-Khmer languages, like those of other South-East Asian languages, include many contour tones, which reflect the typical bimoric structure of the stressed syllables on which they occur. Distinctions of voice-register (Henderson 1952) in Khmer and several other Mon-Khmer languages have similar origins (Huffman 1976, Gregerson 1976). So tone and register are the reflexes of consonantal phonation distinctions that have been lost in the consonant shifts typical of South-East Asian languages.

Phonation types are more stable in isomoric and isosyllabic languages, so rephonologization of consonant phonation as tone is rare in India. Where it has occurred, as in the Munda language Korku, the resulting tones are level rather than contour (Zide 1966b).

7.4. *Rhythm and vowels*

Mon-Khmer languages show vowel reduction, but Munda languages often show vowel harmony. The difference results from their opposite rhythms.

In the Mon-Khmer rising word rhythm, the unaccented initial syllable is anacrustic, and there is pressure to minimize it. Since it is not in the beat with the rest of the word, its vowel can suffer a fairly context-free reduction—shortening, narrowing, and loss of color (labial, palatal or velar). This is a perpetual tendency, producing synchronic variation as in Khmer *prə'lim* ~ *prə'lim* 'dawn', *prə'hael* ~ *prə'hael* ~ *pə'hael* 'similar', *bəŋ'riən* ~ *bəŋ'riən* 'to teach', etc., even in borrowed words like French *cravat* > Khmer *kraa'wat* ~ *kra'wat* ~ *krə'wat* 'necktie'. Indeed the vowel can be lost entirely, as in **bə'lu*: > Khmer *'pliw* 'thigh', cited earlier, or *ba'zaar* > Khmer *'psaa*. In the Viet-Muong group, this resulted in monosyllabism. Other language families of South-East Asia, since they share the same iambic word rhythm as Mon-Khmer, show a similar treatment of their unaccented vowels. Chamic languages, for example, shifted the penult-accented words in their inherited Austronesian lexicon to final accent, and then reduced the rhythmically demoted vowels (Thurgood 1999).

In the Munda falling word rhythm, on the other hand, the whole word is usually part of a single beat or measure, and in its syllable- or mora-timed rhythm even unaccented syllables get at least one mora of time. They are less apt to be reduced (narrowed, bleached) than harmonized to features of other vowels in the word. Harmony can involve color, as in the **bə'lu*: > Munda **'bulu* 'thigh' example, or height, as in the *o/u* alternation

of Korku *kor* ‘person’ with the plural ¹*kur-ku*, or the *a/ə* and *o/u* alternations in Santali ¹*āonda*, ¹*āundi* ‘anxiously’. Every Munda subgroup shows evidence of synchronic or diachronic vowel harmony. See Donegan (1993) for examples, and Bodding (1930: 18–34) for a discussion of the association of harmony in Santali with its two-syllable stress-unit (our beat). Harmony also occurs in Dravidian (Bright 1966) and Indo-Aryan (e.g. Majumdar 1970: 118–119 on Oriya, Chatterji 1926: 387–402 on Bengali), as well as in remote falling-rhythm language families like Altaic and Uralic.

The typical South-East Asian vowel system has a back or central unrounded series. These vowels can be reconstructed in every subgroup of Munda (Munda 1969, Norman Zide 1965, 1966b, Stampe 1978, Arlene Zide 1982), but they have been eliminated separately in each group by fronting, rounding, or lowering, so that most Munda languages have the five-vowel systems typical of Indian languages. Sora is the only language that keeps these un-Indian central vowels, but even here they only occur in closed syllables, which suggests that their intrinsic shortness is not so compatible with a syllable rhythm. As in most Indian languages—and most languages with a syllable rhythm, Munda vowel qualities have apparently remained quite stable for centuries, except for this loss of central non-low vowels.

In marked contrast to the stable vowels of Munda, the stressed vowels of Mon-Khmer, like those of other languages with stress-timing, undergo repeated diphthongizations and vowel shifts. Many Mon-Khmer languages retain a vowel-length distinction; this was lost in Munda, probably because moving the accent off the final syllable in the change to falling rhythm caused the vowel of that syllable to shorten. And many languages reinforce the short vs long distinction with lax vs tense, and then also with in-gliding (centering) like *iə*, *uə*, *wə*, vs outgliding diphthongs like *ai*, *au*, *aw*. Register differences, as in Khmer, also can affect vowel qualities (Gregerson 1976). This multiplication of vowel qualities often leads to further diphthongization and vowel shifts (Donegan 1993 gives examples and comparisons with European vowel shifts). As a result, Mon-Khmer languages often have large vowel inventories. While the typical Munda language has five vowels (Sora is extraordinary in having nine), among Mon-Khmer languages, nine counts as a small vowel inventory. Khmer, in Huffman’s analysis (1970a and b), has thirty-one vowels (including long and short monophthongs and diphthongs); other Mon-Khmer languages have even more.

8. Rhythmic and Grammatical Convergence in Head-last Structure

We have proposed that the holistic oppositeness of Munda and Mon-Khmer linguistic structure could have been the result, after many millenia,

of a simple change of Munda from a rising to a falling rhythm. But falling rhythm imposes head-last order and synthetic structure, which are both so complicating (section 3.2) that one must ask why they persist in South Asia and nearly half the world's languages, and indeed why they exist at all.

The answer must be that falling rhythm itself has intrinsic value. It has been noted that child speech shows a “trochaic bias” (Allen and Hawkins 1978, 1980). This bias is clearly a reflection of the fact that the division of real time into beats and measures is universally front-prominent: temporal compensation and phonetic processes operate within groupings of strong–weak, never weak–strong.²² Only words and phrases spoken in a falling rhythm fit neatly into these universal divisions of time.

In ‘A new knife is hard to sharpen’, as spoken in Sora (16), dependents go on the main beats, so that phrases fit into measures, and words into half-measures. (The prefix in ə-*taji*-,*ben* is squeezed in by anacrusis.)

- (16) Falling (Sora):
-
- [⁴/₄ *'təb, mɛ* *^kəŋ, di-n*] [*ə-'taji-, ben* *^kəl, kəl*]
 new_D knife_H to.sharpen_D hard_H

But words and phrases spoken in rising rhythm, as in the Khmer translation (17), *never* fit into the rhythmic divisions. Putting the final syllables of dependents on the main beats, the result is that phrases straddle measures, two-syllable words straddle half-measures, and many rests are needed:

- (17) Rising (Khmer):
-
- [⁴/₄ *,kəm, bət* *'tməy*] [*,pi, baa?* *,sam, 'liəŋ*]
 knife_H new_D hard_H sharpen_D

Reducing minor syllables to anacrusis (♩ ♩ → ♩ ♩) and extending major syllables over following rests (♩ ♩ → ♩ ♩) fits the words into half-measures in a typically Mon-Khmer fashion,

- (17') Khmer with maximal anacrusis and legato:
-
- [⁴/₄ *km, bət* *'tmə:y*] [*pə, baa:?* *sm, 'li:əŋ*]

but it does not fit the phrases into the measures. To do that the words and phrases of (17) would have to be reversed from rising to falling rhythm:

- (18) Pseudo-Khmer with falling rhythm:
-
- [⁴/₄ *'kəm, bət* *^tməy*] [*^pi, baa?* *'səm, liəŋ*]
 knife_H new_D hard_H sharpen_D

But the accentuation is backward for head-first order: *A knife_H that's new_D is hard_H to sharpen_D*. Falling phrase rhythm requires a head-last order:

- (19) Pseudo-Khmer with falling rhythm and head-last word order:
-
- ['tməy kəm,bət] ['sam,liəŋ pi,bə?]
 new_D knife_H sharpen_D hard_H

This is exactly how Munda diverges from Mon-Khmer, with a drift from head-first to head-last order (19) accompanying a regularizing shift from rising to falling rhythm (18).

The opposite drift to head-first in languages like English may be driven by grammatical simplicity and regularity (section 3.2), but this is achieved only with a shift from a tight, regular fit of words and phrases into beats and measures (20a) to a loose, syncopated fit (20b):

- (20) (a) (= 13a) Old English:
-
- [stórmàs þær] [stánclifu bêotàn]
 storms there stone-cliffs beat
- (b) (= 13b) Modern English:
-
- [alóng càme a spíder] [and sât dówn beside her]

It does not seem unreasonable, then, to suppose that a head-last, synthetic drift, as in Munda, might be driven by rhythmic simplicity and regularity.

9. Conclusion

The divergent typologies of the Austroasiatic languages of South vs mainland South-East Asia, and of the several other language families in either area, are not limited to synthetic and head-last vs analytic and head-first grammatical structure, but pervade every level of structure down to phonetics and prosody (section 1). The two areas are not only different, but opposite at every level, even in falling vs rising rhythms (2). Since the Munda languages of South Asia and the Mon-Khmer languages of South-East Asia are genetically related, one of them must have changed. Munda shows rich evidence of an earlier head-first analytic structure, and there is little evidence of earlier synthetic structure in Austroasiatic (3.1). Munda therefore must have changed, becoming synthetic and head-last in spite of the problems of that structural type (3.2). But the opinion that such a shift was due to areal influence does not stand up to close scrutiny (3.3).

We propose that Munda had a genuine independent drift to synthetic and head-last structure due to a shift from rising to a falling rhythm. Rising vs falling rhythm go with head-first vs head-last syntax because of the backgrounding of heads relative to their dependents (section 4). And they go with prefixing vs suffixing morphology due to the backgrounding of affixes relative to their stems (5). Their effects extend to timing as well: word (stress) isochrony is optimal, but languages must settle for mora or syllable isochrony if suffixing makes their words too variable in length (6). These timing differences deeply affect the phonology of syllables (7.1), consonants (7.2), tone and register (7.3), and vowels (7.4). While the shift from rising to falling rhythm in Munda might have been due to contact, it might instead be due to the fact that grammatical and rhythmic structure are in phase only with falling rhythm (8).

The better-known drift of Indo-European from head-last to head-first structure is well attested in Celtic, Romance, and other western languages. That drift was reversed in India as Indo-Aryan was adopted by Mundas and Dravidians with their falling rhythms, and by the time of the Prakrits, Indo-Aryan was Indo-European in little but etymology. Munda structures are far more various and cognates far fewer than in Dravidian, and likewise than in eastern Austroasiatic. This suggests that the Austroasiatic people may have dispersed from South Asia rather than South-East Asia, and that the shift of Munda from rising to falling rhythm, after the eastern languages had moved eastward, may have been the cause rather than the effect of the profound polarization of South and South-East Asian language structures.

Notes

- * Research on this paper began in the 1970's and was reported in papers cited under Donegan and/or Stampe in the bibliography. For help and/or argument, we thank Paul Benedict, Chris Court, Gérard Diffloth, Ulli Dressler, Talmy Givón, Joseph Greenberg, Ken Hale, Eugénie Henderson, Paul Hopper, Bernhard Hurch, Philip Jenner, Bhadriraju Krishnamurti, Bill Labov, Greg Lee, Winfred Lehmann, Ilse Lehiste, Christopher Longuet-Higgins, Jim McCawley, Miren Lourdes Oñederra, Frans Plank, A. K. Ramanujan, Haj Ross, Chhany Sak-Humphry, Eric Schiller, Ron Scollon, Harry Shorto, Raj Singh, Frank Southworth, Richard M. Stallman, Stan Starosta, Larry Thompson, Graham Thurgood, Ben Ts'ou, Michael Witzel, Carl and Flo Voegelin, Theo Vennemann, Norman Zide, and Arnold Zwicky.

For help in our work on the languages, we thank E. Annamalai, Sudhibhushan Bhattacharya, H. S. Biligiri, Beryl Girard, Allison MacDonald, Bijoy and Ranganayaki Mahapatra, Khageswar Mahapatra, Veena Malhotra, Ram-Dayal Munda, Arjunguru J. Patel, Heinz-Jürgen Pinnow, Dobek Pujari, Mōnōsi Raika, Tabano Saōra, Norman Zide and members of his Indian and American Munda Languages

Project in the 1960s (see Stampe 1965–1966), and grants from the University of Chicago, Ohio State University, the American Institute for Indian Studies, the Fulbright Program, the National Endowment for Humanities, and the National Science Foundation.

And finally, we thank Yo Tomita for his TrueType *Bach Musicological Font*, available as shareware at <http://www.music.qub.ac.uk/~tomita/bach-mf.html>.

1. ‘In honor of our old friend Stanley H. Starosta’, who joked with us in Sora, the language used to represent Munda in this paper, and one of the many languages in which he was wittier, and about which he was wiser, than anyone else we know. A memorial for Stan is at <http://www.ling.hawaii.edu/faculty/stanley/>.
2. On the divergent structures of Munda and Mon-Khmer, see Pinnow 1960; for a brief overview and maps, see Diffloth (1978), Parkin (1991, ethnography only), and <http://ling.ill.hawaii.edu/austroasiatic/>. The only etymological dictionary and comparative phonology of Austroasiatic is Pinnow (1959), despite its modest title, *Versuch einer historischen Lautlehre der Kharia-Sprache*. Articles, reviews, and bibliography on Munda are now included in *Mon-Khmer Studies*.
3. Table 1 is simply a table of contents, not a tabulation of invariable associations in these languages nor in languages of the world. Any theories here are in the text, not in the table. The column headings of the table, Munda and Mon-Khmer, reflect the custom in South-East Asian forums of calling all non-Munda Austroasiatic languages Mon-Khmer. This is an areal rather than a genetic grouping. In fact the genetic subgroupings of Austroasiatic are mostly undemonstrated.
4. Our Sora phonemic transcriptions differ from IPA usage mainly in that *y*, *j*, *r*, *d* are used for IPA [j, ɟ, ʈ, dʒ]. The vowel transcribed *u* is a high unrounded (compressed) labial, as in Japanese and Finnish Swedish, for which there is no IPA symbol. The IPA-based transcription that christianized Soras use, adapted from one devised by Ramamurti (1931, 1933, 1938) after he heard Daniel Jones lecture on the new IPA in Madras in 1911, is unreliable for vowels, as is Ramamurti’s, who inconsistently transcribed Sora vowel qualities in terms of accent and length, which led Pinnow (1959) wrongly to reconstruct vowel length for proto-Munda.

Norman Zide’s Munda project briefly revived linguistic work on Sora: in 1962 by Stampe and the late H. S. Biligiri with Monosi Raika and Damano Buyo, then in 1963 by Starosta, Bijoy P. Mahapatra, and K. Ranganayaki [later K. Mahapatra] with Raika and Tabano Saora. Later work has been done by Arlene R. K. Zide, Khageswar Mahapatra, Piers Vitebsky, Stampe and Donegan with various guides. Besides their works in the reference list, all contributed to a new dictionary of Sora which continues to grow (a link is at <http://ling.ill.hawaii.edu/austroasiatic/>).
5. Our Khmer transcriptions, except where we quote others’ citations, are in the system of Huffman (1970a, 1970b), except that we use *ʔ* instead of *q*, to parallel our Munda forms. On Khmer see also Maspero (1915), Henderson (1952), Jacob (1960 through 1993), Pinnow (1979a, b), Jenner and Pou (1980–81), Pou (1992), and Sak-Humphry (1996).
6. The term *linguistic area*, Harry V. Velten’s translation of N. S. Trubetzkoy’s term *Sprachbund*, has geographic as well as typological reference. But in fact the Indian linguistic area, as Masica (1976) pointed out, actually extends far northwest of India and Pakistan. And it also includes the Tibetan-Burman languages, which

extend north through Tibet and east—in the case of Burmese and Karen—to overlap the typologically South-East Asian languages (Mon, etc.) of Burma. On the other hand, the language area called (mainland) South-East Asia—just in the case of Khasi (Mon-Khmer) and Khamti (Daic)—overlaps the typologically South Asian languages of north-eastern India, and it extends north into China to include Chinese (at least in its southern varieties), and south to include the Mon-Khmer languages of the Malay Peninsula (Aslian) and of the Nicobar Islands.

On the traits of the South Asian linguistic area, see Emeneau (1956), Kuiper (1966), and particularly Ramanujan and Masica (1969), Masica (1976). On Indo-Aryan see the surveys of Bloch (1965) and Masica (1991) and the etymological dictionary of Turner (1966). On Dravidian see the surveys of Steever (1998) and Krishnamurti (2003) and the etymological dictionary of Burrow and Emeneau (1984). On Tibeto-Burman, there is <http://stedt.berkeley.edu/>, the web site of James Matisoff's Sino-Tibetan Etymological Dictionary and Thesaurus project, with maps and bibliography, but no etymologies so far.

On the traits of the South-East Asian area, see Henderson (1965), Huffman (1973), Matisoff (1973), and Gregerson (1976). The *STEDT* web site lists as forthcoming a volume *Languages of Mainland Southeast Asia*, edited by Matisoff, in the *Cambridge* [University Press] *Language Surveys* series.

7. On the reasons for the irreversibility of “grammaticalization”, see, for example, Hopper and Traugott (1993).
8. Zide and Anderson (2001) describe Donegan and Stampe (1983) as connecting polysynthesis to falling rhythm in Munda, but if we had done that we couldn't have explained why Munda polysynthetic constructions are head-first! The explicit links to falling/rising in our article did not include polysynthesis, which begins as compounding, and as we showed, Sora has both older rising and newer falling patterns in compounds. (On compounds in this paper see section 5.1.)
9. Head-first vs head-last order, or right-branching vs left-branching structure, have been called *progressive* vs *regressive* (e.g. Yngve 1960). These are just technical terms (cf. their use in labeling perseveratory vs anticipatory assimilation), but in the present section, quoting Jespersen's evaluative use of the term *progressive*, their ambiguity seemed irresistibly apt. We argue in defense of regressive structure in section 8.
10. Kieckers (1931), Schmidt (1926), and Meillet and Cohen (1924) (the first edition, where the Munda section (385–403) was written by J. Przyluski).
11. There are Dravidian loanwords in languages in contact with Oraon (Kurukh) in Chota Nagpur or with Telugu in Andhra Pradesh, but these look recent.
12. Ironically, there is abundant evidence of early lexical influence of Indo-Aryan (Sanskrit and Pali) on Mon-Khmer, as can be seen in the dictionaries of inscriptions in Mon (Shorto 1971) and in Khmer (Pou 1992).
13. There is one group of Dravidian languages with some head-marking, incorporating pronominal objects, namely the South Central group, including Telugu and tribal languages spoken around the Koraput Munda area. But Steever's excellent study of analysis-to-synthesis in those languages (1993) shows little that is like Munda.
14. A bibliography is in Pinnow (1959: 480–486).

15. This applies of course to gestural language as well, and also to the coordination of speech and gesture. Jim McCawley once remarked in conversation that not only must both pronouns in *He ate his lunch* be deictic for both to be accented but also for both to be accompanied by pointing. The word, the gesture, and the accent are simultaneous. To a singer or dancer or comedian, there is nothing mysterious about this: the accent is a beat in the tacit real-time rhythmic stream to which we put the words and the movements. We linguists get this the wrong way around and speak of putting the accent on a certain syllable or word. That is like saying that Fridays come on payday! A rhythmic accent is a not an “accentuation”: *every* complete utterance, even a one-syllable word, is fitted into real time on a main beat (and thus takes a “primary accent”), even if it is swallowed as in the very British example [ˈkʲkju] x̣.̣.̣.̣ ‘Thank you’ of Daniel Jones (Abercrombie [1964a] 1965: 20). The view that syllables are put on accents, just as words are put to music, and not vice versa, brings together the insights of Lashley on serial behavior (1951), Lehiste on speech rhythm (1970 etc.), Longuet-Higgins and Lee on musical rhythm (1984), and a long tradition in verse metrics.
16. The correspondence of dependents and interrogatives is an ancient observation. Starosta argued in a Tuesday linguistics seminar at the University of Hawai‘i that the *modi significandi* of medieval grammar correspond to dependents in modern grammar. The modes of signifying (predicating) were based on the *categories* of Aristotle, which corresponded to the Greek interrogative pronouns.
17. We are grateful to Frans Plank for making us clarify that we do not of course mean that the dependent is always the newer information, but only that it is the default locus of newer information, and therefore that the grammatical association of the main beat with the dependent is a *conventionalization* of the pragmatic association of the main beat with new information.
18. The un glossed Sora inflections in Table 3 are the verbal affixes *-t* ‘present tense’, *-ε* ‘third person singular subject’ and the nominal affixes *dɔŋ-* ‘dative/accusative’ (which is *suffixed* to noun objects), and *-(ə)n* ‘article’.
- In the examples in the final row of the table, Sora and Khmer differ in a way that is typologically characteristic. Head-first Khmer embeds a relative clause with a finite verb, but head-last Sora avoids the finite verb and reduces the relative clause to a postpositional phrase.
19. The incompatible use of the term *foot* in verse metrics and in musicology (Cooper and Meyer 1960) makes us reluctant to follow Abercrombie (1964a) and many others in using *foot* to refer to beats. In the past we have sometimes used *measure*, but that traditional term is best reserved for larger structures built up of beats, e.g.

$\frac{4}{4}$ | or $\frac{4}{4}$ |
¹el.e.yat.or [^]op.e.yat.or in.tell.i.gence test ^cram session

We view pauses (junctures) as phrase or word edges mapped onto rest beats, as in the contrast of meaning and phrasing in this traditional minimal pair:

$\frac{4}{4}$ | |
 [¹old [¹men and ¹wom.en]]

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