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Prosodic Systems: Mainland Southeast Asia

Marc Brunelle, James Kirby, Alexis Michaud, Justin Watkins

Abstract:

Mainland Southeast Asia is often viewed as a linguistic area where five different language phyla – Austroasiatic, Austronesian, Hmong-Mien, Sino-Tibetan and Kra-Dai – have converged typologically. This chapter illustrates areal features found in their prosodic systems, but also emphasizes their oft-understated diversity.

The first part of the chapter describes word level prosodic properties. A typology of word shapes and stress is first established: we revisit the concept of monosyllabicity, go over the notion of sesquisyllabicity (as typified by languages like Mon or Burmese) and discuss the realization of alternating stress in languages with polysyllabic words (such as Thai and Khmer). Special attention is then paid to tonation. Although many well-known languages of the area have sizeable inventories of complex tone contours, languages with few or no tones are common (20% being atonal). Importantly, the phonetic realization of tone frequently involves more than simply pitch: properties like phonation and duration often play a role in signaling tonal contrasts, along with less expected properties like onset voicing and vowel quality. We also show that complex tone alternations (spreading, neutralization and sandhi processes), although not typical, are well-attested.

The second part of the chapter addresses the less well-understood topic of phrasal prosody: prosodic phrasing and intonation. We reconsider the question of the amount of conventionalized intonation in languages with complex tone paradigms and pervasive final particles. We also show that information structure is often conveyed by means of overt markers and syntactic restructuring, but that it can also be marked by means of intonational strategies.

1. Scope of the chapter

Mainland Southeast Asia (MSEA) is often defined as a Sprachbund, a linguistic area where languages from five different phyla (Austroasiatic, Austronesian, Hmong-Mien, Kra-Dai and Sino-Tibetan) converge and develop similar structures (Matisoff 1973; Alieva 1984; Enfield 2003; 2005)¹. While convergence processes are easy to identify in the region, its geographical boundaries are ill-defined, and one should not understate its typological diversity (Henderson 1965; Brunelle & Kirby 2016, Kirby and Brunelle 2017). In this chapter, we cover the area encompassing the Indochinese Peninsula (Vietnam, Cambodia, Laos, Thailand, Myanmar and Malaysia), but also include Guangxi and Yunnan in Southern China (excluding Chinese varieties, covered in Chapter XXX) and Northeast India. As Austronesian languages are covered in a separate chapter, our discussion of this phylum is limited to Chamic languages spoken in Vietnam and Cambodia, and to Austronesian languages of the Malay peninsula.

Our main goal is to give an overview of representative types of word-level (§2) and phrase-level prosody (§3), highlighting areas of convergence between families, without understating their diversity.

2. Word-level prosody

In this section, we first discuss the most common word shapes and stress patterns found in MSEA (§2.1). As these two properties are largely dependent, they are discussed together. We then give an overview of the diverse tonation systems of the region (§2.2).

2.1 Word shapes and stress

The basic vocabulary of many MSEA languages is monosyllabic. This is the case in most Kra-Dai and Hmong-Mien languages, but also in Vietnamese, an Austroasiatic language. However, in most of these languages, a significant part of the lexicon is made up of compounds, and most languages also have some polysyllabic loanwords. This can be illustrated with Vietnamese. The Vietnamese basic lexicon is largely monosyllabic, as illustrated in (1). Our transcriptions follow the transcription conventions in Kirby (2011), except for the tone notation.

¹ Indo-European and Dravidian languages are also spoken by sizeable language communities in Burma, Malaysia and Northeast India, but are not covered in this chapter.

(1) Vietnamese monosyllables

<i>đi</i>	[dī ⁴⁴]	‘to go’	<i>ngiêng</i>	[ŋiəŋ ⁴⁴]	‘to be leaning’
<i>tuyết</i>	[tɿjət ⁴⁵]	‘snow’	<i>ngoan</i>	[ŋwa:n ⁴⁴]	‘to be well-behaved’

However, Vietnamese has a significant proportion of non-monosyllabic words. According to Trần and Vallée (2009), 49% of its lexicon is disyllabic and 1% is trisyllabic. Native compounds (2) and reduplicants (3) make up most of the disyllabic vocabulary.

(2) Native Vietnamese compounds

<i>nhà nghỉ</i>	[ŋa ²¹ ŋi ²¹]	house+rest	‘inn, low-end hotel’
<i>kiếm ăn</i>	[kiəm ⁴⁵ an ⁴⁴]	search+eat	‘to make a living’
<i>bố mẹ</i>	[bɔ ⁴⁵ mɛ ^{31?}]	father+mother	‘parents’
<i>vui tính</i>	[vuj ⁴⁴ tiŋ ⁴⁵]	happy+temper	‘to be good-tempered’

(3) Vietnamese reduplicants

<i>bạn bè</i>	[bɑ:n ^{31?} bɛ ²¹]	friends + RED	‘friends’
<i>tim tím</i>	[tim ⁴⁴ tim ⁴⁵]	RED + purple	‘purplish’

Vietnamese also has a large number of compounds whose morphemes are borrowed from Chinese. These often have opaque semantics that, as such, seem better analyzed as polysyllables (4). A significant number of loanwords from other languages are also polysyllabic, even if monomorphemic (5). Besides, although this is rarely pointed out in the literature, a number of native Austroasiatic words like *tắc kè* [tak⁴⁵ kɛ²¹] ‘gecko’ and *thọc lét* [t^hɔk³¹ lət⁴⁵] ‘to tickle’ seem to constitute polysyllabic morphemes.

(4) Opaque Sino-Vietnamese compounds

<i>tuần lộc</i>	[twǎn ²¹ lok ³¹]	docile + deer	‘elk, reindeer’ 馴鹿
<i>thái độ</i>	[t ^h a:j ²⁴ đɔ ^{31?}]	appearance + degree	‘behavior’ 態度

(5) Vietnamese monomorphemic polysyllables (loanwords)

<i>ban công</i>	[bɑ:n ⁴⁴ koŋm ⁴⁴]	balcony (< French <i>balcon</i>)
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<i>phô tô cốp pi</i>	[fo ⁴⁴ to ⁴⁴ kɔ̃k ⁴⁵ pi ⁴⁴]	photocopy (< French <i>photocopie</i>)
<i>Trà Vinh</i>	[tɕa ²¹ viŋ ⁴⁴]	place name (< Khmer [<i>Preah</i>] <i>Trapeang</i> ព្រះត្រពាំង)

By definition, monosyllabic words cannot bear paradigmatic or syntagmatic word stress. However, even in languages whose core lexicon is monosyllabic, polysyllabic words can have fairly complicated stress patterns. While Vietnamese polysyllables do not seem to show any type of word-level prominence (Brunelle 2017), the Indic loanwords of many Southeast Asian languages have alternating stress systems that are not necessarily attested in their native lexicon (Luangthongkum 1977; Potisuk *et al.* 1994; Potisuk *et al.* 1996; Green 2005). For instance, polysyllabic Thai words show a tendency to alternating iambic stress, stress clash avoidance and the application of the stress-to-weight principle, as illustrated in (6).

(6) Stress in Thai polysyllabic words

(examples adapted from Luangthongkum 1977:199)

โทรทัศน์	,t ^h o:rə't ^h át	'television'
มะเร็งในเม็ดโลหิต	mə,ɾeŋnəi,métlo'hít	'leukemia'
ไวยากรณ์ปริวรรต	,waijə,kə:npəri'wát	'transformational grammar'

In these Thai polysyllables, stress is realized primarily through longer duration. The tones of stressed syllables are also realized more fully, while those of unstressed syllables are raised and partially neutralized (Potisuk *et al.* 1996).

Many MSEA languages also have a canonical *sesquisyllabic* word shape, a structure typical of the region. The concept of sesquisyllable seems to be attributable to Henderson (1952), but the term was coined by James Matisoff (1973) to designate words containing “one syllable and a half”. Generally-speaking, a sesquisyllable is a disyllable with an iambic stress pattern. Its unstressed first syllable is called the *minor syllable* or the *presyllable*, and has a reduced phonological inventory and a limited array of possible syllable structures. Its stressed second syllable has the full array of possible contrasts of the language and can have a more complex syllable structure.

Sesquisyllables show variation across and sometimes even within languages. Thomas (1992) argues that there are four types of sesquisyllables. In the first type, a fully predictable

schwa is inserted in some clusters, as in the Khmer word ក្បាល [kəba:l] ‘head’ which is underlyingly /kba:l/. Most authors consider such cases as monosyllables rather than sesquisyllables and treat their schwa as an excrescent vowel (Thomas 1992; Butler 2014). The second type of sesquisyllables consists of iambic disyllables in which the first vowel is a schwa, and where the C°C- sequence contrasts with corresponding CC- clusters. Examples from Jeh, an Austroasiatic language of the Central Vietnamese Highlands, are given in (7).

(7) Jeh sesquisyllables (Gradin 1966)

trah	‘to chop out’	tə'rah	‘to squawk (of chicken)’
khej	‘month’	kə'hej	‘moon’

The third and fourth types of sesquisyllables distinguished by Thomas are qualitatively similar; they consist of sesquisyllables whose minor syllables can only contain a subset of the vowels that can appear in main syllables. Examples from Northern Raglai, an Austronesian language of South-Central Vietnam, are given in (8). While Northern Raglai has six phonemic vowels that contrast in length and nasality, only three are allowed in minor syllables.

(8) Northern Raglai (Nguyễn 2007)

pi'tuk	‘cough’	pa'tih	‘thigh’	bu'maw	‘mushroom’
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Interestingly, the trochaic mirror image of sesquisyllables, namely disyllables with an initially stressed syllable and a reduced second syllable, does not seem attested in MSEA.

Many languages of the area also have a non-sesquisyllabic polysyllabic structure as their canonical word shape. One example is Malay, a language that tends to have disyllabic roots, but can have much longer grammatical words because of affixation or loans from Indic or Western languages. Careful analysis strongly suggests that Peninsular Malay does not have word stress (Mohd Don *et al.* 2008). Many Sino-Tibetan languages can also be shown to be polysyllabic because segmental or tonal processes affect their prosodic words. In Qiang and Shixing, for instance, the lenition of word-medial consonants provides positive evidence for polysyllabic prosodic words (LaPolla and Huang 2003: 31-32, Chirkova 2009: 12-13).

2.2 Tonation

Many Southeast Asian languages employ one or more contrastive laryngeal properties that we term *tonation* (following Bradley 1982). This includes not only the use of pitch but also properties such as vowel quality, voice quality, intensity, and/or duration. The extent to which it is useful to sub-typologize languages according to exactly which property or properties they (canonically) employ remains a matter of some debate (Abramson & Luangthongkum 2009; DiCanio 2009; Enfield 2011; Gruber 2011; Brunelle & Kirby 2016); despite this, we have broadly organized the following sections by phonetic property in order to emphasize the diversity and phonetic variability of the region's word-level prosodic systems.

2.2.1 Inventories

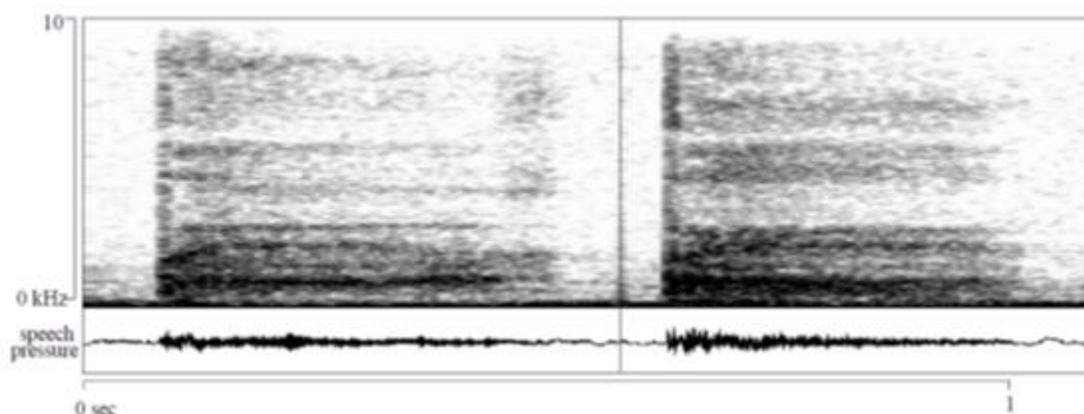
Around 20% of the languages spoken in MSEA are completely atonal (Brunelle & Kirby 2015). These languages are virtually all either of Austronesian or Austroasiatic stock. Diversity is greater in Austroasiatic, while Austronesian languages of MSEA are either atonal or have simple tonation-type properties².

Many languages of the area, especially in the Austroasiatic and Austronesian phyla, have been described as having 'registers'. Henderson (1952) was the first author to employ the term *register* to refer to a 'bundle' of (broadly suprasegmental) features, such as phonation type, pitch, vowel quality, intensity, and vowel duration, leading to the designation of (voice-)register languages in the Southeast Asian linguistic literature (Henderson 1952; Gregerson 1973; Ferlus 1979; Diffloth 1982). Register is normally understood to arise from the neutralization of voicing in onsets and subsequent phonologization of phonetic properties originally associated with voicing.

A hallmark of register systems is redundancy, in the sense that one can identify multiple co-occurring properties. The Austroasiatic language Mon is an example of a canonical register system relying on pitch and phonation, but also on vowel quality and duration (Lee 1983; Diffloth 1985; L-Thongkum 1987; Abramson et al. 2015). Another example is Wa, a Mon-Khmer language spoken in north-eastern Myanmar and in the south-west of Yunnan province in China, that distinguishes two lexical registers termed 'clear' and 'breathy' (Watkins 2002).

² Tsat, a Chamic (Austronesian) language spoken in Hainan, has a full-fledged tone system (Maddieson and Pang 1993, Thurgood *et al.* 2015).

In Wa, vowels in breathy register are characterised principally by their relatively breathier phonation type than the modal phonation of clear register vowels, illustrated in (9). In addition, there are typically differences such that clear register vowels have slightly higher pitch than breathy register vowels. Vowel duration and vowel quality are mostly insignificant with respect to Wa register, though for some speakers there may be contrasts in these quality differences.



(9) Register in Wa. Spectrograms of the clear register word *tɛ* ‘sweet’ (left) and breathy register *tɛʔ* ‘peach’ (right). The clear register is characterised by sharper, more clearly defined formants; the breathy register has relatively more energy at very low frequencies and high frequency noise.

The Wa register contrast applies independently of syllable-final /h/ and /ʔ/, making possible the set of distinct syllables in (10).

(10) vowel register independent of laryngeal consonants in Wa

<i>tɛ</i>	‘sweet’	<i>tɛʔ</i>	‘peach’
<i>tɛʔ</i>	‘land’	<i>tɛh</i>	‘swear’
<i>tɛh</i>	‘reduce’	<i>tɛʔh</i>	‘turn over’

An outstanding question concerns the stability of register systems, which have frequently been seen to ‘restructure’ (Huffman 1976), or move to realize a contrast by means of a single acoustic property. An apparently recent shift from register to a primarily pitch-based system has been documented for several dialects of Khmu (Suwilai 2004; Svantesson & House 2006; Abramson *et al.* 2007). Restructuring can also lead to the development of a large vowel inventory, as apparently occurred in the history of Khmer (Huffman 1976) or Haroi (Lee 1977;

Mundhenk & Goschnick 1977).

We can contrast registers with tone inventories based on pure pitch. By ‘pure’ pitch, we mean to refer to a system in which pitch is the only phonetic exponent of a suprasegmental tonation contrast. A good example of such a language in MSEA might be Southern Vietnamese (Brunelle 2009b, Gsell 1980, Vũ 1982). However, setting aside restructured register languages such as Khmu, it is not clear if such systems actually exist, and if they do, they may in fact be rather rare: it seems reasonable to assume that there are always at least low level spectral effects present in ‘pure’ pitch systems. In any case, it is probably still possible to differentiate between tone systems where these spectral effects are redundant, and those systems where they are a necessary element of patterns of tone contrasts, as detailed in the following section.

A related issue here concerns the phonological analysis of primarily pitch-based tone systems. The languages of sub-Saharan Africa provide compelling evidence for an analysis based on sequences of level tones (from two, High and Low, to as many as five levels; see Chapter XXX). In Asia, such systems appear to be significantly less common (see Evans 2008 for an overview), though cases do exist such as Pumi (Jacques 2011; Daudey 2014; Ding 2014) and Yongning Na (Michaud 2017: 87-101). Evidence for this type of decompositional analysis comes primarily from morphotonological alternations (see §2.2.2). To our knowledge, these systems are restricted to Sino-Tibetan languages of the Himalayas, on the northern periphery of the area under consideration here. Analyses of other languages of SEA in terms of level tones have also been proposed (e.g. Morén & Zsiga 2006 on Thai), but such proposals are challenging to evaluate in the absence of language-internal (morpho)phonological evidence (Clements *et al.* 2010).

Finally, MSEA is home to a number of languages with complex tonation systems involving multiple phonetic properties. While there may be a certain amount of variation, a hallmark of such systems is the canonical co-occurrence of two or more phonetic properties. For example, three of the six tones in Northern Vietnamese are systematically realized with a laryngealized voice quality in sonorant-final syllables (Vũ 1982; Nguyễn & Edmondson 1997; Michaud 2004), and perceptual research has shown that the strong glottalization of the low glottalized tone is normally sufficient for identification, to the point of largely overriding pitch cues (Brunelle 2009b). Hmong-Mien languages also tend to exhibit systems of this type (Huffman 1987; Andruski & Ratliff 2000; Esposito 2012; Garellek *et al.* 2013; Garellek *et al.* 2014). For

example, Black Miao, a Hmong-Mien language spoken in Guizhou province, China, contrasts five level tones, but three of these tones are also respectively characterized by laryngealized, tense, or breathy phonation, all of which are important cues for accurate native-speaker discrimination (Kuang 2013). Although strictly speaking outside of MSEA proper, a number of Wu languages spoken in China also have mixed phonation/pitch tonation systems (Rose 1989). These languages are perhaps especially notable for employing ‘whisper’ and/or ‘growl’ phonation types, probably involving oscillation of epilaryngeal structures (Edmondson *et al.* 2001).

2.2.2 Tonal phonology, tone sandhi and morphotonology

Tone serves a wide range of functions in the world’s languages: in addition to its phonemic function, it can mark grammatical categories; it can be assigned according to paradigm-specific rules; and it can even constitute the sole phonological form of a morpheme (see Chapter XXX **Word Prosody II: Tone systems**). In MSEA, the vast majority of Austroasiatic, Austronesian and Tai-Kadai tone languages have “inert” tones (tones that are not active in phonology or morphology), whereas productive tonal processes are more commonly found in some Hmong-Mien and Sino-Tibetan languages.

The first type of tone process found in the area is tone sandhi in its narrow sense: a tone turns into another contrastive tone in a specific tonal environment. For instance, White Hmong has seven tones, out of which five undergo the permutations in (11) in most compounds and some phrases. This tone sandhi seems partly fossilized in contemporary White Hmong, but there is little doubt that it was productive at an earlier stage of the language (Ratliff 1987; Mortensen 2004).

(11) White Hmong tone sandhi (Ratliff 1987)

52, 22, 31?	→	4̣2	
24	→	33	/ 55, 53 _____
33	→	22	

Tone sandhi must be distinguished from tonal coarticulation, which could be characterized as phonetic accommodation between adjacent tones. Studies of tonal coarticulation in Central Thai and Vietnamese suggest that progressive coarticulation is much stronger than regressive, and that assimilatory effect are more common than dissimilatory ones in these languages (Han & Kim 1974; Gandour *et al.* 1992b; 1992a; 1994; Brunelle 2009a). Tone sandhi could develop from the misinterpretation of some forms of tone coarticulation, but this seems to require more than simple phonologization (Brunelle *et al.* 2016).

The most complex sandhi-like processes in the region are doubtless found in the Kuki-Chin languages of Burma, Mizoram and Nagaland. In these languages, combinations of tone spreading and positional tone sandhis sensitive to the boundaries of prosodic domains are commonplace (Hyman and VanBik 2002; 2004; Watkins 2013). In the Tibeto-Burman southern Chin language Sumtu, of which the Myebon dialect is described by Watkins (2013), a morpheme may have lexically high or low tone. Functional morphemes attached to a noun or verb stem may have no lexically specified tone, in which case their tone is derived by a process whereby high and low tones alternate such that adjacent highs or lows are avoided where possible, i.e. unless a lexically specified tone makes adjacent highs or lows inevitable. Examples of sentences with a lexically high tone verb stem [pék] ‘give’ and a low tone verb [hɲà] ‘borrow’ are given in (12). To the right a string of verbal auxiliaries and particles are attached, and to the left of the stem a subject/object prefix is attached. Only the verb stem has lexical tone: the attached morphemes are assigned alternating high and low tones so no adjacent tones are the same.

(12) a. ʔə-m-pék-bà-láʔ-hní L-H-L-H-L

3-TR-give-again-must-PRF

‘He has had to give back.’

b. ʔə-m-pék-làʔ-hní L-H-L-H

3-TR-give-must-PRF

‘He has had to give.’

c. ʔə-hɲà-láʔ-hní H-L-H-L

3-borrow-must-PRF

‘He has had to borrow.’

In Sumtu, the dual number in verb paradigms is indicated by tone, as shown in (13). The lexically low tone verb [sìʔ] ‘go’ has minor-syllable pronominal prefixes attached. In the singular and the plural forms, these prefixes have a high tone: having lexically assigned tone, they assume the tone which is the polar opposite of the stem to which they are attached. However, the dual number is indicated by a tone change in the pronoun prefix; the low tone dual pronominal prefix provokes a dissimilatory tone change in the verb stem, so that in the dual forms the verb stem has a high tone.

(13) Tone change in Myebon Sumtu dual number verb forms

	SINGULAR		DUAL	PLURAL
1	kḗ-sìʔ	INCL	mḗ-síʔ	mḗ-sìʔ
		EXCL	kḗn-síʔ	kḗn-sìʔ
2	nḗ-sìʔ		nḗn-síʔ	nḗn-sìʔ
3	ʔḗ-sìʔ		ʔḗn-síʔ	ʔḗn-sìʔ

A second type of tone alternation is *tone spreading*, a process observed in some level-tone systems: for instance, in Yongning Na (Sino-Tibetan) L tone spreads progressively (“left-to-right”) onto syllables that are unspecified for tone (Michaud 2017: 324). *Spreading* of level tones is a process of phonological copying; this needs to be distinguished from cases where the domain of phonetic realization of a lexical tone category is the entire phonological word, as in Tamang (Sino-Tibetan). The four tones of Tamang *unfold* over an entire phonological word: non-initial syllables of words, whether they be a suffix or part of a single morpheme, never carry their own tone, so that their f_0 curve can be considered an expression of the tone lexically carried by the initial lexeme, which is allowed to unfold over the available space -- the entire phonological word (Mazaudon & Michaud 2008). This can usefully be distinguished from *tonal coarticulation* on toneless syllables, as illustrated by Northern Mandarin, where the phonetic realization of a toneless suffix is heavily influenced by the tone of the preceding syllable but where the latter can still be considered to be realized phonetically on the syllable to which it is lexically associated

(Chen and Xu 2006).

Tone can also be used for marking morphological alternations. In MSEA, this is relatively rare, except in Sino-Tibetan, where morphological alternations involving tone are most abundant in Kuki-Chin (see Ozerov in preparation for an overview and a case study of Anal) and in Na-Qiangic (Evans 2008; Jacques & Michaud 2011; Daudey 2014). Cases of morphology conveyed solely by tone (i.e. tonal morphology proper) are much rarer than cases of conditioning of tone assignment by morphosyntax (i.e. morphotonology). In Anal (Ozerov in preparation), omission of grammatical suffixes leads to a grammatical distinction being marked only by tonal alternations on the last syllable of the stem. Interestingly, traces of the reduced suffix can consist of (i) changed tone, (ii) vowel lengthening, or (iii) both tone change and vowel lengthening. Another example is the Burmese creaky tone, which can express possession on a restricted number of lexemes (pronouns, kinship terms and a few more) in place of the full possessive marker, also carrying creaky tone (Okell & Allott 2001: 273). Naxi (Sino-Tibetan) has cases of reduction of H-tone grammatical words to a floating H tone, whereas M- and L-tone syllables that become coalescent are reported to retain a vowel target of their own, i.e. the reduction process stops short of complete segmental ellipsis (Michaud & He 2007).

3 Phrasal prosody

The phrasal prosody of MSEA languages has attracted far less systematic attention than their word-level prosody. In this section, we first review research on prosodic domains (§3.1). We then go over descriptions of intonational patterns and their interaction with final particles (§3.2) and explore the role of information structure in the languages of the area (§3.3).

3.1 Prosodic phrasing

The study of prosodic phrasing in MSEA has developed steadily in the past decade. Research has focused on the difficulty of applying the standard Prosodic Hierarchy (Selkirk 1984; Nespor & Vogel 1986) to the languages of the region. While some languages, like Boro, faithfully conform to the Hierarchy (Das 2017), a number of researchers question the very existence of a universal hierarchy, especially in the Sino-Tibetan domain, and argue for emergent domains (Hildebrandt 2007: 353-376; Bickel *et al.* 2009; Post 2009; Schiering *et al.* 2010; Michaud 2017).

Most studies adopt a narrower scope and focus on evidence (or lack thereof) for specific prosodic domains (Phạm 2008; Chirkova & Michaud 2009; Karlsson *et al.* 2012; Brunelle 2016). For instance, the absence of segmental or suprasegmental processes in grammatical words argues against the existence of a prosodic word in Vietnamese (Schiering *et al.* 2010; Brunelle 2017; but Phạm 2008). The lack of phonetic difference between homophonous compounds and phrases, like *hoa hồng* [hwa⁴⁴ hoŋm²¹] (flower + pink) ‘rose’ or ‘pink flower’, reinforces this conclusion (Ingram & Nguyễn 2006).

To our knowledge, the issue of prosodic recursion, the embedding of a prosodic constituent within a constituent of the same type, has not yet been explored systematically in MSEA. A notable exception is Boro, a language in which a tone spreading process suggests that enclitics are parsed into a recursive prosodic word that also encompasses the prosodic word formed around its host (Das & Mahanta 2016; Das 2017).

3.2 Intonation

The study of intonation, and more specifically that of the interaction between tone and intonation, has been studied in a number of MSEA languages. Although it is still too early to reach strong conclusions, it seems that boundary tones³ can play an important role in the intonational phonology of languages with small tone inventories (Blood 1977; House *et al.* 2009; Karlsson *et al.* 2010; Karlsson *et al.* 2012; Phạm & Brunelle 2014). In Northern Khmu, a two-way tone contrast does not prevent the realization of a phrasal H tone on the rightmost edge of every prosodic phrase; the tone curves are adjusted accordingly (Karlsson *et al.* 2012). A simpler example is Eastern Cham, a language in which sentence-final boundary tones concatenate with register on the final syllable, as illustrated in (14).

(14) Final boundary tones realized on the final in Eastern Cham (Phạm and Brunelle 2014): registers are autosegmentally represented as H/L for convenience.

a.	$\begin{array}{cccccc} \text{L} & \text{H} & \text{H} & \text{L} & \text{L} & \text{L}\% \\ & & & & & \\ \text{ç} & \text{a} & \text{k} & \text{a} & \text{n} & \text{a} \\ \text{w} & & \text{p} & \text{a} & \text{j} & \text{ç} \\ & & & \text{?} & & \text{ç} \end{array}$	b.	$\begin{array}{cccccc} \text{L} & \text{H} & \text{H} & \text{L} & \text{L} & \text{H}\% \\ & & & & & \\ \text{ç} & \text{a} & \text{k} & \text{a} & \text{n} & \text{a} \\ \text{w} & & \text{p} & \text{a} & \text{j} & \text{ç} \\ & & & \text{?} & & \text{j} \end{array}$
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³ The term *boundary tone* is used as a convenient label for intonational effects that are mostly realized at the edge of intonational domains. The authors recognize a divergent range of views on whether these effects should be formalized as tones or as a different type of primitive (on this topic, see Rialland *to appear*).

boy *name* go study already
 ‘Ka has gone to school.’

boy *name* go study already
 ‘Has Ka gone to school?’

The effect of boundary tones can also be seen in languages with large tone inventories. The clearest cases are languages in which the pitch contour of toneless particles can be predicted based on intonation, such as Thai (Pittayaporn 2007), or in which an intonational contour overrides the lexical tone of discourse markers, like backchannels and repair utterances in Northern Vietnamese (Hà 2010; 2012). However, the typical scenario in such languages is that intonational effects are realized through a combination of various cues, such as the global pitch height and slope of the utterance, phrase-final pitch contour and duration (Trần 1967; Đỗ *et al.* 1998; Luksaneeyanawin 1998; Nguyễn & Boulakia 1999; Michaud 2005; Vũ *et al.* 2006; Brunelle *et al.* 2012; Mạc 2012). It is unclear if these intonational cues, which show great speaker variability, can be analyzed as categorical boundary tones in the autosegmental-metrical sense (Michaud 2005; Brunelle *et al.* 2012; Brunelle 2016).

The lack of categorical realization of intonation in languages with large tone inventories could be facilitated by sentence-final particles, which are a pervasive feature of most MSEA languages. These often have the same function as intonation, arguably making it redundant. In fact, Hyman and Monaka (2011) have proposed to treat such particles as a part of the intonational system. However, the existence of final particles alone does not imply that intonation is not employed, either redundantly or primarily (e.g. Dryer 2013); much more work in this area is needed.

3.3 Information structure

In many MSEA languages, information structure is primarily marked by means of syntactic restructuring and overt morphological markers. The reader is referred to Michaud and Brunelle (2016) for an overview of such markers in Yongning Na and Vietnamese. More relevant to this chapter is the prosodic marking of information structure. Although these structures have not received much attention in the languages of the area, they seem to mainly include prosodic phrasing and overt focus.

A Yongning Na example of information structure realized through prosodic phrasing is given in (15). In this example, ‘dog meat’ is topicalized and thus forms a tone group separate

from the rest of the sentence, a phrasing that is marked by the bolded tone changes (see Michaud 2017: 324-327 for detailed tone rules).

- (15) /k^hvɿmiɿ-**ʂeɿ** **dzɯ**ɿ məɿ ɗoɿ piɿ zo/
 dog-meat eat NEG ought_to say ADVB
 k^hvɿmiɿ-**ʂeɿ**, **dzɯ**ɿ-məɿ-ɗoɿ-piɿ-zoɿ
 ‘It is said that one must not eat dog meat! / It is said that dog meat is something one must not eat!’ (Michaud and Brunelle 2016)

Vietnamese is the MSEA language in which overt focus has been studied the most systematically. Studies have been conducted on corrective focus (Michaud 2005; Vũ *et al.* 2005; Brunelle 2017) and pragmatic focus (Jannedy 2007). Results reveal that speakers can realize focus through a number of correlates of vocal effort, such as raised f_0 and intensity, increased duration, and a fuller realization of tone contours and phonation types associated to tones. However, speakers do not need to use all these cues simultaneously, and they exhibit significant individual variation. In spontaneous speech, prosodic focus is normally accompanied by morphosyntactic focus-marking strategies.

4 Conclusion

In this short chapter, we have attempted to give an overview of the diverse prosodic systems of MSEA. We have argued that it is difficult to characterize the languages of the region in terms of a few stereotypical prosodic properties. The chapter also reflects the state of our current knowledge on the prosodic structures of MSEA: while their word-level prosody is well-understood, it is imperative that more work be conducted on their phrasal prosody, which is still ill-understood.

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