Does Vietnamese have prosodic words?
A Mon-Khmer development and its typological significance
René Schiering & Balthasar Bickel, University of Leipzig

1. Introduction

- A common denominator of most previous work on prosodic words is the assumption that one and only one such domain between the foot and the phonological phrase can be identified across languages (Nespor & Vogel 1986, Dixon & Aikhenvald 2002).

- However, recent typological work on the cross-linguistic distribution of such domains reveals that there are actually more possibilities in individual languages, which suggests that prosodic structure between foot and phrase might be more complex than previously thought (Schiering, Bickel & Hildebrandt 2006).
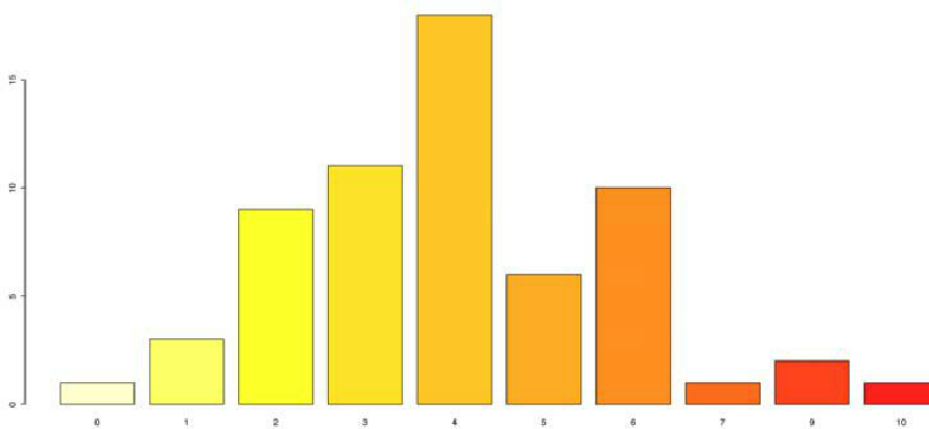

Figure 1: Number of non-isomorphic domains (exhaustively surveyed languages only, *N*=62)

- Furthermore, it turns out that genealogical stock, *but not area,* is a reliable predictor for the encountered cross-linguistic distribution. This finding suggests that prosodic structure between foot and phrase is to a large extent genealogically inherited and stable across time, independent of areal pressure (Bickel, Hildebrandt & Schiering, in preparation).
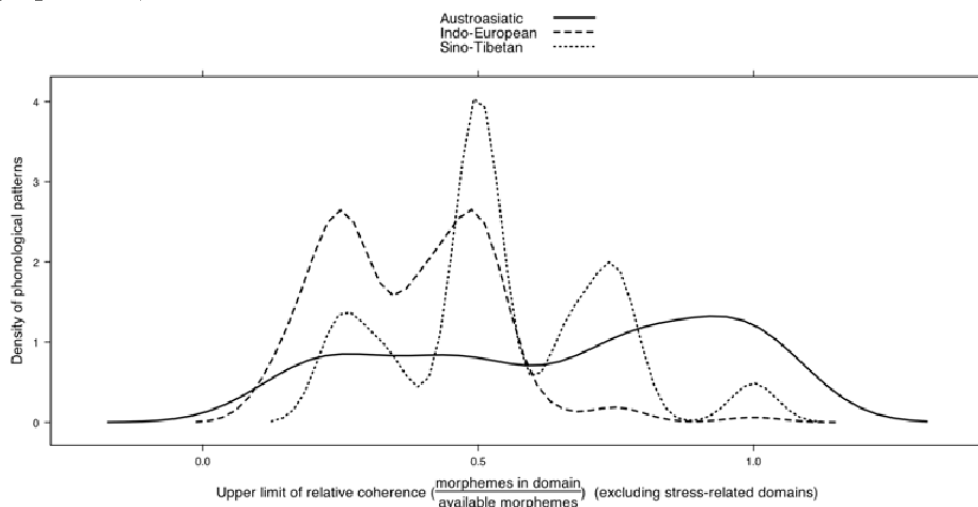

Figure 2: Coherence by stock (stock: F(2) = 18.1, *p* <.001, area: F(2) = 1.36, *p* > .05, follow-up tests (Tukey's Honestly Siginificant Difference): Indo-European vs. Austroasiatic: *diff.* = -.11, *p* < .0003, Sino-Tibetan vs. Austroasiatic: *diff.* = -.09, *p* < .004, Sino-Tibetan vs. Indo-European: *diff.* = .02, n.s.)
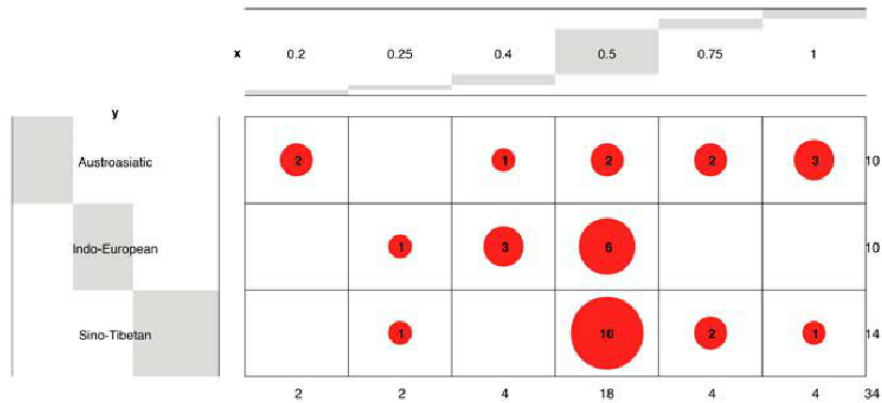
Figure 3: Number of modal coherence types by stock (Fisher Exact Test, p = .01, follow-up tests: Indo-European vs. Austroasiatic: p = .03, Sino-Tibetan vs. Austroasiatic p = .03, Sino-Tibetan vs. Indo-European: n.s.)

- Austroasiatic has a unique prosodic word profile which significantly differs from both Indo-European and Sino-Tibetan.

- In this paper we explore a possible explanation for the Austroasiatic profile, focusing on Mon-Khmer. A special challenge in this comes from Car and Vietnamese which resist the motivation of prosodic words, but we suggest that this a natural result of the same trends within the family.

2. Words domains in Mon-Khmer

- A prosodic word is defined here as the domain of a phonological pattern that can only be defined with reference to morphological structure (stems, affixes, clitics and combinations thereof). Accordingly, we will first illustrate the morphological structure of the languages discussed before we proceed to the prosodic word domains.

2.1. Morphological domains in Mon-Khmer

- Taking Mon as our example, we can identify the following morpheme types which are referenced by phonological pattern: stems, prefixes, infixes, proclitics and enclitics (1). The distribution of the various morpheme types across Mon-Khmer is illustrated in (2).

(1)   Morpheme types in Mon (Jenny 2005: 121, Bauer 1982: 105)
        a. *làc* 'break down'   stem
        b. *p-lac* 'break down sth.'   prefix
        c. *pə-lac* 'tear down'   prefix
        d. *hə-làc* 'blast away'   prefix
        e. *k-ə-lɒʔ* 'take across'   infix
        f. *paʔkɒ klɒʔ* 'make cross over' proclitic
        g. *kwan nɔʔ kòh* (village this DEF) enclitic

2

(2)   Morpheme types in Mon-Khmer

Cambodian	proclitic	prefix	infix	stem	suffix	enclitic	(6)
Car	proclitic	prefix	infix	stem	suffix	enclitic	(6)
Chrau		prefix	infix	stem	suffix		(4)
Jahai	proclitic	prefix	infix	stem			(4)
Khasi	proclitic	prefix		stem	suffix	enclitic	(5)
Khmu	proclitic	prefix	infix	stem			(4)
Mon	proclitic	prefix	infix	stem		enclitic	(5)
Pacoh		prefix		stem			(2)
Semelai	proclitic	prefix	infix	stem	suffix	enclitic	(6)
Vietnamese	proclitic	prefix		stem	suffix	enclitic	(5)

2.2.   Phonological words in Mon-Khmer

2.2.1. *Minimal/Maximal word size*

- The Mon-Khmer languages in our sample show an overall tendency towards bimoraic minimal words and disyllabic maximal words. As the Mon examples in (3) show, bimoraic minimality crucially affects the prosodic shape of the stem, whereas disyllabic maximality crucially affects the shape of prefix±infix±stem strings.

(3)   The minimal/maximal word in Mon (Jenny 2005: 33ff., Bauer 1982: 99)
          a. /ʔa/ → [ʔaː] 'go'   (coherence = 0.2)
          b. [hə-làc] 'blast away'   (coherence = 0.6)
          c. [k-ə-lɒʔ] 'take across'   (coherence = 0.6)
          d. /tɔʔnɔʔ/ → [tənɔʔ] 'these'   (coherence = 0.4)

(4)   Minimality and maximality in Mon-Khmer

Cambodian	*kaa* 'work', *bət* 'to close'	*kɔ.kaay* 'to scratch'
Car	*ca* 'tea'	[n.a.]
Chrau	*hwi* [hwiː] 'wide'	*panang* 'room'
Jahai	/cɛp/ 'to catch'	/kaltoŋ/ 'knee'
Khasi	/kʰla/ → [kʰla(·)] 'tiger'	*kr̩teŋ* 'name'
Khmu	*ʔàa* 'to open', *ʔàh* 'to have'	*tr̩ʔò ʔ* 'to crow'
Mon	*ʔa* [ʔaː] 'go'	*pə-lac* 'tear down'
Pacoh	*caː* 'to cat', *mat* 'eye'	*kən.trɔ̤ːʔ* 'a bought (of rain)'
Semelai	/tʰi/ [tʰiː] 'hand'	[kə.ru.wan.ceŋ] 'coral snake'
Vietnamese	*đi* 'go'	*Sài-gòn*

2.2.2. *Stress/Tone*

- The ten Mon-Khmer languages discussed here all have final stress at the word and at the phrase level. Note the peculiar lack of distinct stress patterns in words as opposed to phrases in Vietnamese, a point to which we shall return later.

(5)   Stress in Mon (Bauer 1982: 99ff.)
       a. ('tɛm)_ω 'to know'   (coherence = 0.2)
       b. (pə'tɛm)_ω 'to inform'   (coherence = 0.6)
       c. [(ˌɲìʔ)_ω('ɲɛ̀ʔ)_ω]_P 'a little (bit)'
       d. [(ˌcɔŋ)_ω(hə'kùi)_ω]_P 'to cause to burn'
       e. [(hə̀ˌtom)_ω('cih)_ω]_P 'to fall down'

(6)   Word and phrasal stress in Mon-Khmer

Cambodian	kɔ'kaay 'to scratch'	kookrɔ'bəy 'oxen and buffalo'
Car	/la'ʔoh/ 'to be broken' /'vɛɔk/ 'to grunt'	/kuřiŋtɛn cɔ'n 'cin/ 'I push John down'
Chrau	pa'nang 'room'	---
Jahai	/kal'toŋ/ 'knee'	[n.a.]
Khasi	kɾ'teŋ 'name'	ŋa léɟ 'I go'
Khmu	tɾ̀'ʔòʔ 'to crow'	[n.a.]
Mon	pə̀-'lac 'tear down'	kwan 'mòa 'a village'
Pacoh	kən.'trɔːʔ 'a bought'	'toʔ ʔnnoh, kiː'dɛːʔ ʔnnoh 'When it reaches here, it falls down there'
Semelai	[kəruwan'ceŋ] 'coral snake'	[n.a.]
Vietnamese	---	Tôi không 'biết. 'I don't know'

- The domain for ('quasi')-tonal register is most frequently the monosyllabic stem. In Mon, the voiced continuants /y, w, r, l, ŋ, ɲ, n, m/ control the second register, whereas /ʔ, ɗ, ɓ, s, h/ control the first register. In disyllabics, register harmony applies in Indo-Aryan loans and native words consisting of the prefix /ʔiʔ-/ and a stem.

(7)   Register harmony in Mon (Bauer 1982: 8)
       a. ʔa 'go'   (coherence = 0.2)
       b. làc 'break down'   (coherence = 0.2)
       c. /ʔuʔcàn/ → [ʔùʔcàn] 'park/garden'   (coherence = 0.2)
       d. /ʔuʔpətè/ → [ʔùʔpətè] 'law'   (coherence = 0.4)

(8)   Register in stems and complex forms in Mon-Khmer

Khmu	pháa 'cloth', ʔàa 'to open'	pʰ̀-priàl 'to spare s.b.'s life' pʰ̀-kléʔ 'to show'
Mon	ʔa 'go', làc 'break down'	/ʔuʔcàn/ → [ʔùʔcàn] 'park/garden'
Vietnamese	---	mau 'fast', mau mắn 'very fast'

2.2.3. Phonotactics

- The most salient feature of syllable structure in Mon-Khmer is the dichotomy of minor syllables and major syllables, sometimes also referred to as pre- and main syllables, which together constitute the maximal word shell.

(9)   The phonotactic word shell in Mon (Jenny 2005: 33)
      a. *ʔa* 'go'   CV
      b. *ket* 'take'   CVC
      c. *phya* 'market'   CCV
      d. *plop* 'insert'   CCVC
      e. *kəla* 'box'   cəCV
      f. *hətɛm* 'remember'   cəCVC
      g. *ʔəkra* 'between'   cəCCV
      h. *ʔəklɛk* 'blind person'   cəCCVC

- In our database, this disyllabic phonotactic word shell is coded with appeal to a number of phonotactic constraints, such as a ban on onset clusters for prefix pre-syllables and the restriction of superheavy syllables to monosyllabic stems (see Appendix).

(10)   The phonotactic word shell in Mon-Khmer

Cambodian	C(C)V(C)	C(C)(C)V(V)(C)
Car	---	(C)V(C)
Chrau	CV	(C)(C)CV(C)
Jahai	C(V)(C)	CVC
Khasi	CC̩/Cə	(C)CCV(C)
Khmu	CC̩/Cə	CCV(C)
Mon	Cə	C(C)V(C)
Pacoh	C(V)(C)	C(C)V(C)
Semelai	CəC/CuC	CV(C)
Vietnamese	---	C(C)V(C)

2.2.4. Summary

- In our quantitive measure, the dominance of the monosyllabic stem and the maximally inflected disyllabic word in Mon surface as peaks at the coherence level 0.2 and 0.6, respectively.

- Although there are notable differences across the Mon-Khmer languages of our sample, a comparable bimodal distribution with a parallel motivation is found in Cambodian, Chrau, Khasi, Khmu, and Pacoh (cf. Figure 4).
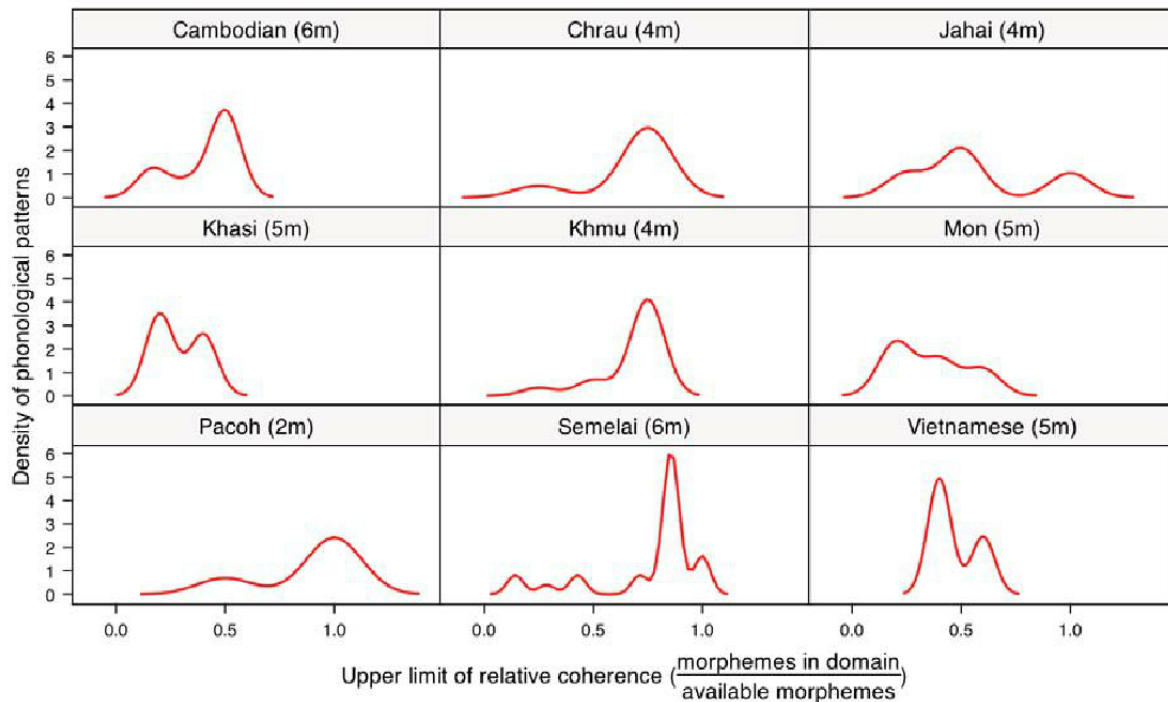
Figure 4: Mon-Khmer profiles (including lexically specified processes; excluding Car, for which there is no evidence of prosodic words, not even from lexically-specialized patterns); 'm' = Number of distinct morpheme types in the language

3.   Does Vietnamese have prosodic words?

- In several respects, Vietnamese does not pattern with most other Mon-Khmer languages, since it lacks a number of prosodic properties: bimoraic minimal word, word stress, register dependent on the initial, and the presyllable.

- Most of these properties stem from the fact that Vietnamese completed developments evident across the family: tonogenesis (Haudricourt 1954) and the gradual reduction of the presyllable which eventually lead to its loss (Ferlus 1992). These developments have a severe impact on prosodic constituency.

(11)   Prosodic constituency with and without presyllable

   a. $[(\sigma\ \sigma)_\omega\ (\sigma\ \sigma)_\omega]_P$

   b. $[(\sigma)_\omega\ (\sigma)_\omega]_P$

- In prosodic structures like (11b.), syllables are indistinguishable from prosodic words and combinations of syllables constitute phonological phrases to the same extent that combinations of words would.

3.1.   Grammatical words in Vietnamese

- Although there is a strong tendency for monosyllabic grammatical words, certain word classes (place names, loan words) as well as compounds and reduplicated words may be polysyllabic in Vietnamese.

6

(12)   Possible word forms in Vietnamese (Thompson 1963: 50f., Nhàn 1984: 181)

	Monomorphemic	Polymorphemic
Monosyllabic	*sớm* 'early', *đi* 'go'	*đ-ây* 'here', *v-ây* 'this way'
	có 'exist', *ghế* 'chair'	*n-ào* 'any', *s-ao* 'however'
Disyllabic	*Sài-gòn* 'town name'	*Mỹ-quốc* 'America', *bối-rối* 'perplexed'
	va-li 'suitcase'	*bàn-ghế* 'furniture', *người ở* 'servant'
Trisyllabic	*Thủ-dầu-một,* 'town name'	*Liên-hiệp guốc* 'United Nations'
	com-mi-nít 'communist'	*ngôn-ngữ học* 'linguistics'
Tetrasyllabic	*a-me-ri-ca* 'America'	*vô-tuyến điện-thoại* 'radio telephone'
Hexasyllabic	---	*bối-rối bối-rối bối-rối* 'be very perplexed'

- The status of polysyllabic words is problematic, since the forms fail on standard criteria of grammatical wordhood as terminal nodes in the syntax, such as non-interruptability and ordering constraints.

(13)   Interruptability of Vietnamese words (Nhàn 1984: 6; Noyer 1998: 82)
a. *cà-phê* 'coffee' vs. *cà với phê* 'coffee and the like'
b. *đo đỏ* 'reddish' vs. *đo không đỏ* 'not reddish'
c. *nhà cửa* 'house, home' vs. *Tôi xay nhà xay cửa* 'I build a house'

(14)   Variable order in Vietnamese words (Nhàn 1984: 6; Thompson 1965: 130)
a. *quần-áo* vs. *áo-quần* 'clothes' (*quần* 'trousers' + *áo* 'tunic')
b. *chọn lựa* vs. *lựa chọn* 'to select' (*chọn* 'choose' + *lựa* 'choose')
c. *bối-rối bối-rối* vs. *bối-rối bối-rối* 'be troubled' (base: *bối-rối*)
d. *com-rom còm-ròm* vs. *còm-ròm com-rom* 'be emaciated' (base: *còm-ròm*)

3.2.   The prosodic status of Vietnamese words

- With respect to the phonological patterns discussed above, Vietnamese words do not exhibit prosodic properties that would necessitate the postulation of a prosodic word domain, since monosyllabic words are indistinguishable from other syllables and polysyllabic words are indistinguishable from other polysyllabic strings.

- The phonotactic shell of monosyllabic words corresponds with the available syllable types in the language. No phonotactic generalization distinguishes a syllable with word status from a syllable lacking word status.

(15)   The syllable in Vietnamese (Nhàn 1984: 80)

Tone / Stress	
Initial	Rhyme
C	(w)V(C)

(16)   The phonotactic shell of the word in Vietnamese
a. *đi* /di/ 'go'   CV
b. *noạ* /nwạ:/ 'lazy'   CwV
c. *bay* /bay/ 'fly'   CVC
d. *ngoài* /ŋwà:y/ 'outside'   CwVC

- With respect to stress, each syllable exhibits some degree of stress. If several syllables are combined to di- or trisyllabic strings, the last syllable in the string usually receives heavy stress. Note that stress is assigned irrespective of the morphosyntactic composition of the string.

(17) Stress in polysyllabic strings across various morphosyntactic composition types in Vietnamese (Thompson 1965: 126ff.; Nhàn 1984: 101)
  a. *va-ˈli* 'suitcase'   (monomorphemic)
  b. *nói ˈnói* 'keep talking and talking'   (reduplicated form)
  c. *mơ ˈmơ màng ˈmàng* 'deep in the state of dreaming'   (reduplicated form)
  d. *người ˈta* 'somebody'   (compound)
  e. *một ˈmình* 'alone'   (compound)
  f. *hoa ˈhồng* 'rose'   (compound)
  g. *hoa ˈhồng* 'pink flower'[1]   (phrase)
  h. *Tôi không ˈbiết.* 'I don't know'   (phrase)

- The only putative evidence for a disyllabic prosodic word domain comes from tone harmony in reduplication where the tone of the reduplicant is of the same register as the one of the base. This process, however, applies only to a subset of reduplicated forms and therefore seems to be a strata effect.

(18) Vietnamese tones

Class A	*ngang*	*sắc*	*hỏi*	*sắc2*
Class B	*huyền*	*nặng*	*ngã*	*nặng2*

(19) Tone harmony in Vietnamese reduplication (Pham 2000: 228)
  a. *mau* 'fast'   →   *mau mắn* 'very fast'   *ngang - sắc*
  b. *láu* 'clever'   →   *láu lỉnh* 'very clever'   *sắc - hỏi*
  c. *đỏ* 'red'   →   *đỏ đan* 'very red'   *hỏi - ngang*
  d. *vất* 'laborious'   →   *vất vả* 'very hard'   *sắc2 - hỏi*
  e. *tàn* 'worn out'   →   *tàn tạ* 'very worn out'   *huyền - nặng*
  f. *lạnh* 'cold'   →   *lạnh lẽo* 'very cold'   *nặng - ngã*
  g. *mỡ* 'greasy'   →   *mỡ màng* 'very greasy'   *ngã - huyền*
  h. *ngặt* 'severe'   →   *ngặt nghèo* 'very hard'   *nặng2 - huyền*

4.   Summary & outlook

- The stock effect for Austroasiatic which was found applying statistical methods receives a fruitful interpretation through an in-depth study of prosodic constituency in the individual language families.

- The different pieces of evidence for the prosodic word in Mon-Khmer suggest an overall profile for the language family which specifies the minimal and maximal size

---

[1] For pairs like (16f) and (16g), production and perception experiments underpin the prosodic identity of disyllabic compounds and phrases. In order to disambiguate the two forms, speakers insert a prosodic phrase boundary after the two elements in the former case or between the two elements in the latter case (Nguyen & Ingram, under review).

of words and which provides a phonotactic word shell which is the target for suprasegmental processes relating to stress and tone.

- The case of Vietnamese poses severe challenges to current theories of prosodic constituency which all assume the universality of the word. In a Mon-Khmer perspective, however, the prosodic structure of the language marks the endpoint of a development which is evident across the whole family, i.e. the gradual reduction and loss of the presyllable.

References

Alves, Mark J. 2000. *A Pacoh Analytic Grammar*. Dissertation, University of Hawaii.

Bauer, Christian 1982. *Morphology and Syntax of Spoken Mon*. London: SOAS.

Bickel, Balthasar, Kristine A. Hildebrandt & René Schiering (in preparation). "On the distribution of phonological word domains in time and space."

Braine, Jean C. 1970. *Nicobarese Grammar (Car Dialect)*. Dissertation, University of California, Berkeley.

Burenhult, Niclas 2005. *A Grammar of Jahai*. Canberra Pacific Linguistics.

Dixon, R. M. W. & Alexandra Y. Aikhenvald (2002). "Word. A typological framework." In: R. M. W. Dixon & Alexandra Y. Aikhenvald (eds.). *Word. A Cross-Linguistic Typology*. Cambridge: Cambridge University Press: 1-41.

Ferlus, Michel 1992. "Histoire abrégée de l'évolution des consonnes initiales du Vietnamien et du Sino-Vietnamien." *Mon-Khmer Studies* 20: 111-125.

Haudricourt, André-G. 1954. "De l'origine des tons en vietnamien." *Journal Asiatique* 242: 69-82.

Huffman, Franklin E. 1967. *An Outline of Cambodian Grammar*. Dissertation, Cornell University.

Jenny, Mathias 2005. *The Verb System of Mon*. Zürich: Universität Zürich.

Kruspe, Nicole D. 1999. *Semelai*. Dissertation, University of Melbourne.

Nespor, Marina & Irene Vogel 1986. *Prosodic Phonology*. Dordrecht: Foris.

Nguyen, Thi Anh Thu & John Ingram (under review). "Word Stress and Compounding in Vietnamese."

Nhàn, Ngo Thanh 1984. *The syllabeme and patterns of word formation in Vietnamese*. Dissertation, NYU.

Noyer, Rolf 1998. "Vietnamese 'Morphology' and the Definition of Word." *University of Pennsylvania Working Papers in Linguistics* 5: 65-89.

Pham, Hoa 2000. "Vietnamese reduplication: phonetics-phonology mismatch of tones." In: Jensen, John & Gerard Van Herk (eds.). *Proceedings of the Annual Meeting of the Canadian Linguistics Association 1999*. Ottawa: Cahiers Linguistiques d'Ottawa: 225-236.

Rabel, Lili 1961. *Khasi, a Language of Assam*. Baton Rouge: Louisiana State University Press.

Schiering, René, Balthasar Bickel & Kristine A. Hildebrandt 2006. "Cross-Linguistic Challenges for the Prosodic Hierarchy. Evidence from Word Domains." Mansucript, University of Leipzig/University of Manchester. [http://www.uni-leipzig.de/~autotyp/download/SchieringHildebrandtBickel2007.pdf].

Svantesson, Jan-Olof 1983. *Kammu Phonology and Morphology*. Lund: CWK Gleerup.

Thomas, David D. 1971. *Chrau Grammar*. Hawaii: University of Hawaii Press.

Thompson, Laurence C. 1963. "The Problem of the Word in Vietnamese." *Word* 19: 39-52.

Thompson, Laurence C. 1965. *A Vietnamese Grammar*. Seattle: University of Washington Press.

Appendix

Language	Ppattern	Domain	Coherence
Mon	Ban on onset clusters	prefix	0.2
Mon	Ban on V-initial syllables *	stem ± prefix	0.4
Mon	Requirement of shwa nucleus	prefix *	0.2
Mon	Occurrence of C.C *	stem ± prefix ± infix	0.6
Mon	Occurrence of onset clusters *	stem ± prefix	0.4
Mon	Disyllabic contraction	prefix + stem *	0.4
Mon	Main stress	stem ± prefix ± infix *	0.6
Mon	Main stress *	stem	0.2
Mon	Maximum Disyllabic *	stem ± prefix ± infix	0.6
Mon	Minimum (long) CV	stem	0.2
Mon	Occurrence of superheavy syllables	stem	0.2
Mon	Vowel register assimilation *	stem ± prefix *	0.4
Mon	Vowel register assimilation *	stem	0.2
Vietnamese	Main stress	stem ± prefix *	0.4
Vietnamese	Main stress	stem ± prefix ± suffix *	0.6
Vietnamese	Tone assimilation	prefix + stem *	0.4

Table 1: Phonological patterns (ppatterns) and their morphological domains in Mon and Vietnamese
(* = restricted to certain lexical items, not general)