ADJECTIVES OR STATIVE VERBS IN MODERN KHMER

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1. Introduction

In Modern Khmer, the sequences of these types of words: *kméeŋ lqaa* and *síiəwphɔ́w thlaj* can be translated into English as "the child is good" or "the good child", and "the book is expensive" or "the expensive book". Thus the words *lqaa* "good", and *thlaj* "expensive" are interpreted as adjectives or verbs.

First, in this paper, I will briefly define the terms adjective, verb, and compound words according to lexicase dependency grammar. Second, I will summarize the previous studies by Jacob, Ehrman, and Huffman. Third, I will illustrate the problem on sequence of these type of words. Fourth, syntactically, I would like to propose and demonstrate that the words in questions or the 'adjective-like' words are: (1) not adjectives; but are stative verbs (subject-predicate); (2) not part of a compound noun; but are stative verbal relative clauses (part of NP) through various strategies of proof.

Evidence that they are stative verbs is based on: (a) synchronic, and diachronic analyses, (b) negation test, and (c) a strong support from the language typology.

2. Definition of adjective, verb and compound word

In lexicase dependency grammar, Starosta (1988:51) defines adjective, verb and compound word as follows: (1) an adjective as the head of an adjective phrase, an endocentric non-predicational attribute of a noun; (2) a verb, as the lexical head of an endocentric clause, bears [+prdc] = predicate as its lexical feature, and doesn't allow adjective [+Adj] or determiner [+Det] attributes (but [+prdc] Ns may); (3) and a compound word as a single word composed of two or more free forms.

3. Previous studies

Jacob's (1968:113) analysis does not have 'adjective' among Khmer word-classes. Her word classification is mostly based on word order and distribution. She refers to words which translate as English adjectives as 'attributive verbs'. By her definition, an 'attributive verb' may follow a noun in close junction. This implies that the head noun and the 'attributive verb' form a constituent. Jacob said the English sequence verbs 'to be' plus adjectives, e.g. "is small", must be translated into Cambodian by verbs. She noted that such verbs are not usually followed by a noun and are often followed immediately by the 'adverbial particles', *nah* very' and *péek* 'too much'[1].

In Ehrman's (1972:59) *Grammatical Sketch*, 'adjectives' are 'stative verbs'. She said that: "in English, adjectives are classed as nominal, however, in Cambodian they are verbs. They occur in the same syntactic positions as action verbs".

In Huffman's (1986:164) predicatives section, "an adjective verb is any predicative which may precede the intensifying adjective *nah* [2] 'very'." Adjectival verbs never occur in construction with a substantive object. Besides occurring as predicatives, adjectival verbs also occur as attributes in attributive constructions with both noun and verb heads[3]. Thus Huffman is using the total range of occurrences to define a word class, so he needs two distinct classes here.

In a lexicase grammar, by contrast, each grammatical environment defines a word class, so that a form that appears in two different environments is analyzed as two homophonous words.

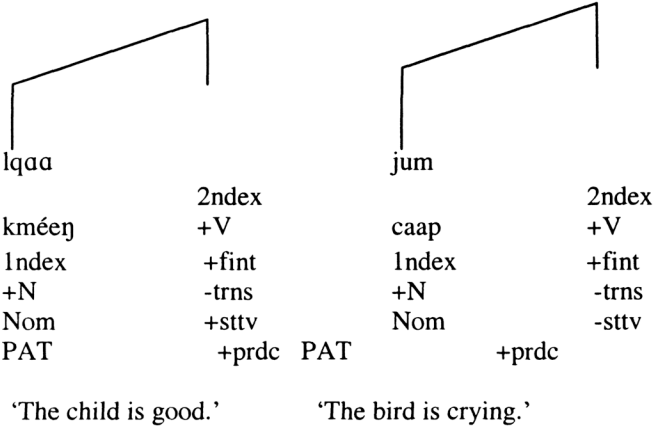## 4. The Problem of sequences of these types of words

Now let us examine these four examples in Modern Khmer:

1. kmèeŋ   lqɑɑ
   child   be good
   'the child is good'
   'the good child'

2. síiǝwphǝ́w thlaj
   book   be expensive
   'the book is expensive'
   'the expensive book'

3. ckɛɛ   khcil
   dog   be lazy
   'the dog is lazy'
   'the lazy dog'

4. caap   jum
   bird   cry
   'the bird is crying'
   'the crying bird'

Jacob (1968: 59) called the first group of words (in examples 1-3) *lqɑɑ* "be good", *thlaj* "be expensive", and *khcil* "be lazy" 'attributive verbs', and the second group of words, such as *jum* "to cry" (in example 4), 'operative verbs'.
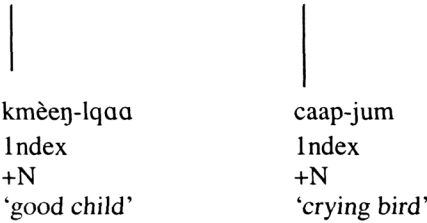
Ehrman (1972: 54-62) labeled the first group 'stative verbs' and the second group 'active verbs'. Huffman (1986: 164-166) identified the first group as ' adjectival verbs' and the second group as 'intransitive verbs'. I, however, start by saying that, given this kind of sequence of word structures, one can speculate that there are two major types of constructions: (1) subject-predicate, where the word in question functions as the main verb and has the noun N as its nominative subject (Figure 1a), and (2) noun phrase NP. Within this NP, we have three interpretations: (a) the word in question forms a compound noun with the first noun (Figure 1b); (b) the word in question is analyzed as an adjective and is the dependent attribute of the regent noun (Figure 1c); (c) the word in question is a verb, and functions as the head of a verbal relative clause (Figure 1d).
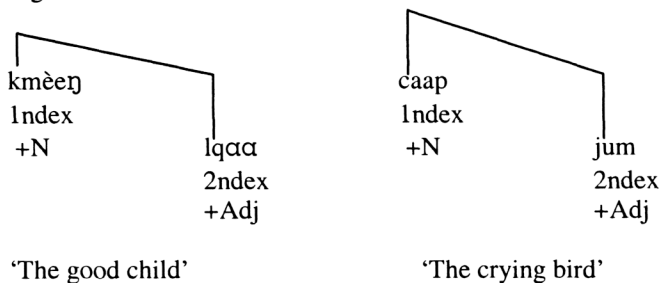
Figure 1a:

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lqɑɑ                         jum
                 2ndex                        2ndex
kméeŋ            +V          caap             +V
1ndex            +fint       1ndex            +fint
+N               -trns       +N               -trns
Nom              +sttv       Nom              -sttv
PAT              +prdc  PAT           +prdc
```

'The child is good.'   'The bird is crying.'

In examples (1-4), the nouns *kmèeŋ* 'child', *síiəwphə́w* 'book', *ckɛɛ* 'dog', and *caap* 'bird' are the dependent nominative subjects of the predicate verbs *lqaa* 'be good', *thlaj* 'be expensive', *khcil* 'be lazy' and *jum* 'to cry' (see figure 1a), respectively. The verbs *lqaa, thlaj,* and *khcil* are intransitive stative verbs and *jum* is an instructive non-stative verb.

Figure 1b:

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 |                          |


kmèeŋ-lqɑɑ                caap-jum
1ndex                     1ndex
+N                        +N
'good child'              'crying bird'
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However , if the independent lexical items *kmèeŋ, lqaa, síiəwphə́w ,thlaj, ckɛɛ, khcil, caap,* and *jum* are bound together thus, they form new compound words *kmèeŋ-lqaa, síiəwphə́w-thlai, ckɛɛ-khcil,* and *caap-jum* as illustrated in figure1b.

155

Figure 1c:

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 ┌─────────────┐
 │             │
kmèeŋ          │
1ndex          │
+N         ┌───┘
          lqɑɑ
          2ndex
          +Adj
```

```
      ┌─────────────┐
      │             │
     caap           │
     1ndex          │
     +N         ┌───┘
               jum
               2ndex
               +Adj
```

'The good child'   'The crying bird'

In figure 1c, suppose that the words *lqaa, thlaj, khcil,* and *jum* are adjectives and function as the dependent attributes of the regent nouns *kmèeŋ, síiəwphɔ́w, ckɛɛ,* and *caap,* respectively.

Figure 1d:

```
 ┌─────────────┐
 │             │
kmèeŋ          │
1ndex          │
+N         ┌───┘
          lqɑɑ
          2ndex
          +V
          +prdc
          +fint
          -trns
          +sttv
```

```
      ┌─────────────┐
      │             │
     caap           │
     1ndex          │
     +N         ┌───┘
               jum
               2ndex
               +V
               +prdc
               +fint
               -trns
               +sttv
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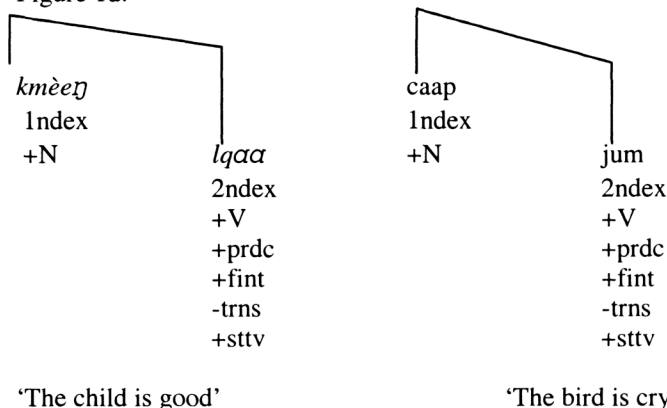'The child is good'   'The bird is crying'

Figure 1d shows that the words *lqaa* 'be good', *thlaj* 'be expensive', *khcil* 'be lazy' are intransitive stative verbs, and *jum* 'to cry' is an intransitive non-stative verb. They function as the heads of the intransitive stative and non-stative verbal relative clauses[4], and as dependent attributes of the regent nouns 'child', *síiəwphɔ́w* 'book', *ckɛɛ* 'dog', and *caap* 'bird', respectively.

5. Proposed Solutions

In my analysis, based on these sequences of words, I propose that the words in question or the 'adjective-like' words *lqaa* 'be good', *thlaj* 'be expensive', and *khcil* 'be lazy', in examples 1-3 are: (1) not adjectives; but (2) intransitive stative and non-stative verbs (predicates taking subjects); (3) are not part of a compound noun; and (4) are stative verbal relative clauses

(part of a noun phrase NP). For me, the word *jum* 'to cry' in example 4 is an intransitive non-stative verb.

6. Evidence for or against their being adjectives

In these types of constructions (examples 1-3), the second words in question are verbs; however, they could be interpreted as adjectives if Modern Khmer contains an adjective word class. Similarly, in Vietnamese, Nguyen (1990: 63) said that the words in these types of constructions are verbs, not adjectives. As for Thai, Saranya (1986: 76) said that stative verbal relative clauses with words such as *suay* 'beautiful' or 'pretty' in Thai, are translated as adjectives and function as such in other languages, but do not contain adjectives in Thai. Reid and Saranya (1997: 12) say, "Tagalog, and Philippine languages which have similar structures, probably do not have a class of adjectives either, since lexical items translatable in English as adjectives are all predicational".

Based on the synchronic study, in my analysis of Old Khmer, there are no adjectives nor is there any adjective word class; instead they are verbs that function as verbal relative clauses to the regent Ns. In Modern Khmer, the words which function as nominal 'adjective' modifiers also function as regular verbs, as illustrated in the above examples. Therefore, it is more economical to regard them as instances of an independently required verbal relative clause pattern, rather than setting up an otherwise unnecessary adjective class. Thus, in Modern Khmer, if they are verbs syntactically, then they are verbs even in relative clause constructions [attributive constructions, ed.] In addition, I have demonstrated in my dissertation (Sak-Humphry 1997: Chapter 9, 241-263), and in a paper on numerals and classifiers in Modern Khmer (1992), that Khmer number words that many people have classified and subcategorized as part of an adjective word class, are in fact nouns rather than adjective, based on their syntactic distributions. For all the above reasons, this class of words can be accounted for without positing an additional and otherwise unmotivated adjective class.

In the following section, first, I hope to demonstrate that the adjective-like words are grammatically verbs because they can take NPs as subject and can have adverbs as their dependent attributes (a subject-predicate construction). Second, after demonstrating that they are verbs, in the subclass of stative verbs more generally, based on syntactic and distributional criteria, I would like to show that: (1) they do not form a compound noun with the preceding noun, because they can be split from the latter by having NP co-dependents; (2) they occupy the relative clause slot; (3) they may be dependent attributes of the relative nouns *daael* or *daa* or the anaphoric noun *qaa* and; (4) syntactically they must bear the [+prdc] feature which is required by their regent Ns.

157

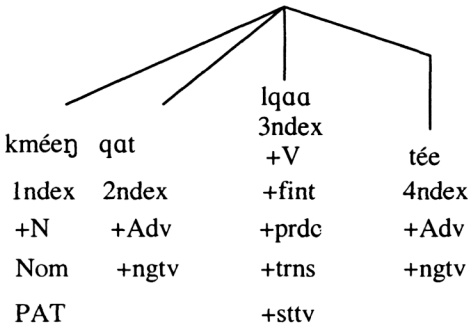**6.1 Evidence that they are stative verbs because they can be negated**

The negation marker *qɑt* or *min* is used in this section to test whether the adjective-like word is a verb or not. Verbs in Modern Khmer can be negated with *qɑt* or *min* and other forms such as *pum*. In colloquial speech the use of the final negation marker *tée* is optional. If it is used, the final negation marker *tée* is positioned at the end of a clause of a construction and can be used to identify the boundary of a clause or a sentence.

If the adjective-like words are verbs, then they ought to be negatable in the same way as are other verbs, by modification by a dependent negative adverb. This one feature in itself might not be enough to distinguish verbs from adverbs, since lexicase dependency grammar allows adjectives to take adverb dependents. However, adjectives, by lexicase definition, are never predicates. If the adjective-like words can function as predicates with their own Nom-PAT subjects, this is an adequate basis for concluding that they are verbs, and the fact that they are negated in exactly the same way and in the same position as other verbs provides additional supporting evidence for this conclusion.

Now let us examine the following sentences:

1a.　　kmɛ̀eŋ　*qɑt* lqɑɑ　　(<u>tée</u>)
　　　　child　　neg be good　　neg
　　　　'The child isn't good.'

2a.　　síiəwphɔ́w　<u>min</u> thlaj　　　(tée)
　　　　book　　　neg　be expensive neg
　　　　'The book isn't expensive.'

3a.　　ckɛɛ　<u>min</u> khcil　(<u>tée</u>)
　　　　dog　neg　be lazy　neg
　　　　'The dog isn't lazy.'

4a.　　caap　*qɑt* jum　(<u>tée</u>)
　　　　bird　neg cry　neg
　　　　'The bird didn't cry.'

5a.　　tunsaaj　*qɑt* sii　cɛ̀ek　　(<u>tée</u>)
　　　　hare　　neg　eat　banana neg
　　　　'The hare does not eat bananas.'

Figure 2a.

		lqaa	
kméeŋ	qɑt	3ndex	tée
		+V	
1ndex	2ndex	+fint	4ndex
+N	+Adv	+prdc	+Adv
Nom	+ngtv	+trns	+ngtv
PAT		+sttv	

In examples 1a through 3a (see Figure 2a.), the stative verbs *lqaa,*
thlaj and *khcil*, have the Nom-PAT *kmèeŋ, síiəwphə́w* and *ckɛɛ* as their
subject NPs, respectively, and thus they are verbs, which implies that they
bear the [+prdc] feature. If they bear this [+prdc] feature, they cannot be
adjectives. In addition, they have the negation markers *qɑt ...tée* or *min...tée*
as their dependent attributes, thus strengthening the claim that they are
verbs, not adjectives.   However, if we compare these structures with
examples 4a and 5a, these stative verbs have similar distributions to the
intransitive non-stative verb *jum* (example 4a) and the transitive verb *sii*
(example 5a), in relation to their negative markers.

6.2 Locational demonstrative pronouns and adverbs function as boundary markers

In this section, I would like to show that the words in question, the
adjective-like words, are verbs, not adjectives because they can have the
adverb *nah* "very", *pèek* "too much" or *craaən* "very much" as their
dependent, or can have the locational demonstrative pronouns *néh, nóh* and
naa immediately preceding them. A preceding *neh, nóh,* or *naa* marks the
right end of an NP, indicating that whatever follows is outside that NP,
while the following adverb *nah, pèek* or *craaən* indicates that the preceding
word is a verb (the lexical head of a predication). Any word appearing in
this position can only be analyzed as the predicate of the preceding noun.

> 1b. kmèeŋ néh lqaa nah
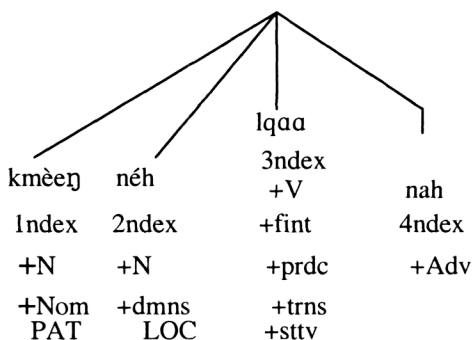>   child this be good very
>   'This child is very good.'

159

2b. síiəwphə́w <u>nóh</u>   thlaj   <u>pèek</u>
   book   that   be expensive   very
   'That book is very expensive.'

3b. ckɛɛ   <u>néh</u>   khcil
   dog   which be lazy
   'Which dog is lazy?'

4b. caap   <u>néh</u>   jum   <u>péek</u>
   bird   this   cry   too much
   'This bird cries too much.'

5b. tunsaaj   <u>naa</u>   sii   cèek   craaən
   hare   which eat   banana   more
   'Which hare eats more bananas?'

Figure 2b.

In examples 1b through 5b, the locational demonstrative pronouns *néh, nóh,* and *naa* are the LOC dependent attributes of the regent nouns *kmèeŋ, síiəwphə́w, kɛɛ,* and *tunsaaj*, respectively.

In examples 1b-3b (see figure b), the intransitive stative verbs *lqɑɑ, thlaj,* and *khcil* are the main verbs and have the Nom-PATs *kmèeŋ, síiəwphə́w,* and *ckɛɛ* as their subjects, respectively.

In example 4b, the non-stative intransitive verb *jum* has the noun *caap* as its Non-PAT. In example 5b, the transitive verb *sii* has the noun *tunsaaj* as its Nom-AGT, and the noun *cèek* as its Acc-PAT. In all of these examples (1b-5b), the adverbs *nah, pèek,* or *craaən* are positioned to the right of their regent verbs at the end of the sentence. The use of the adverb *nah, pèek,* or *craaən* tests if the word in question is a main verb or not.

Thus, I conclude that the adjective-like words have syntactic functions as verbs; therefore, they are not adjectives.

7. Evidence that they are not parts of compound words

The following section will examine the 'adjective-like' word function as a dependent attribute of an NP rather than as a main verb of a sentence. In the relative clause construction, the dependency relationship between the regent N and its dependent word is that this dependent must bear the [+prdc] feature — it must be a verb (on verbal relative clause constructions, cf. Sak-Humphry 1997).

7.1 They divide according to their different kinds of co-dependents

In this section, I will show that the adjective-like words *lqaa* "to be good or pretty", *thlaj* "to be expensive", *thoət* "to be fat", and *khcil* "to be lazy", translating in English as adjectives, do not form compound words with the preceding nouns because they can have co-dependent NPs such as a predicate number noun, possessive noun, anaphoric noun *qaa* , or a relative noun *daaɛl* placed between them and the preceding regent noun. This shows that the adjective-like words are not part of compound words. Compound words[5] (nouns or verbs) are always bonded and the parts always kept together. They form a unit, typically one with a meaning that is not a simple composite of the meaning of the parts, and their components cannot be permuted.[6]

    1c. kmèeŋ <u>bèej</u> <u>neək</u> lqaa   néh khpuəh nah
        child   three clsf be good this tall   very
        'These three good children are very tall.'

    2c. koət luk laan <u>piir</u> thlaj   bamphot nóh
        she   sell car two be expensive most   that
        'She sold those two most expensive cars.'

    3c. koət wíiəj ckɛɛ jəən <u>bəəj</u> <u>daaɛl</u> khcil   nóh
        he   beat dog our three which be lazy that
        'He beats those three dogs of our which are lazy.'

    4c. caap <u>daaɛl</u>   thoət nóh nəw knoŋ truŋ
        bird which be fat that locate in   cage
        'The bird which is fat stays in the cage.'

Figure 2c.
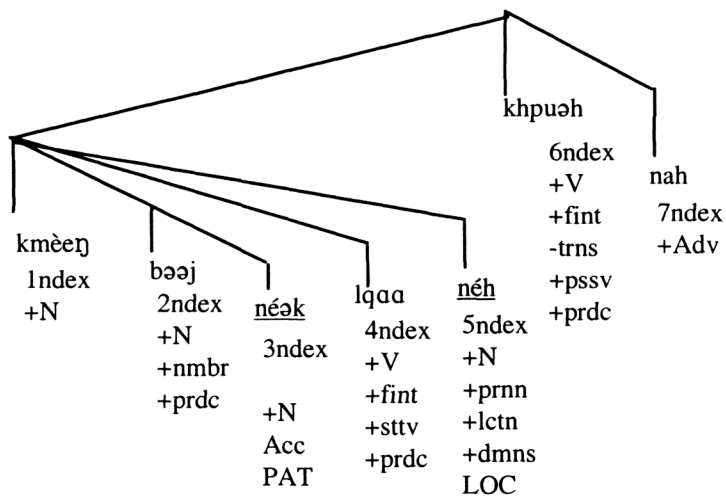
According to this diagram (figure 2c), the main verb *khpuəh* "to be tall" (example 1c) has the subject, Nom-PAT *kmèeŋ*, and the adverb *nah* as its dependent attributes. The regent noun *kmèeŋ* has three dependent attributes: (1) the predicate number noun *bəəj* with *néək* as its predicate classifier dependent, (2) the predicate verbal relative clause with the verb *lqaa* "to be good" as its head, and (3) the LOC locational demonstrative pronoun *néh*.

Figure 2d.

162
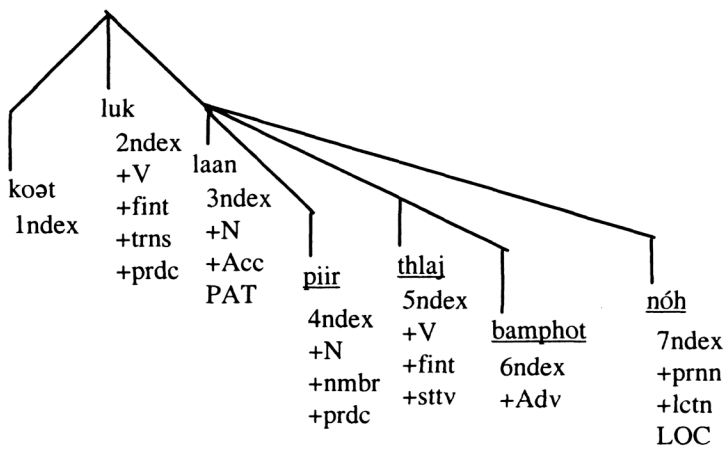
In example 2c (see figure 2d), the word *laan* "car" functions as the Acc-PAT of the main verb *luk* "sell", and the regent of (1) the predicate number noun *piir* "two", (2) the verbal relative clause with the stative verb *thlaj.* "be expensive" as its head, and (3) the locational demonstrative pronoun *nóh.* The predicate number noun *piir* is positioned between the direct object noun *laan* ands the stative verb *thlaj.* This shows that *laan thlaj* is not part of a compound word.

In example 3c, the main verb *wíiəj* "to beat" has the subject *koət* as its Nom-AGT, and the direct object *ckɛɛ* "dog" as its Acc-PAT. The noun *ckɛɛ* has four dependents: (1) the possessive pronoun *jəən* "our", (2) the predicate number noun *bəəj* "three", (3) the verbal relative clause with the predicate relative noun *daaɛl* "which" as its head, and (4) the locational demonstrative pronoun *nóh.* The adjective-like word *khcil* "to be lazy" does not form part of a compound word with the noun *ckɛɛ* "dog" that precedes it, because it is separated by COR *jəən* "our", the predicate number noun *bəəj* "three", and the predicate relative noun *daaɛl* "which". They are its co-dependents. This evidence shows that they are not parts of a compound noun.

Example 4c shows that the predicate relative noun *daaɛl* is positioned between the adjective-like word *thoət* "be fat" and the noun *caap.*

Thus, based on examples 1c too 4c, the adjective-like words *lqaa, thlaj, khcil* and *thoət* cannot form parts of compound words with their respective preceding nouns because these words may be separated by a predicate noun phrase, a verbal relative clause, a possessive noun phrase, or an indirect possessive noun phrase.

7.2 Strategy of proof

We see now that every form that can occur as a bare 'adjective-like' noun modifier can also occur as a verbal predicate. It is independently necessary to establish a pattern of bare verb-headed relative clauses anyway (see detailed analysis in the relative clause section of Sak-Humphry 1997). 'Adjectival' modifiers of nouns fit the relative clause pattern without modification. There is no other evidence that these 'adjectival' modifiers have syntactic properties that require them to be treated differently from verbs; hence, they are verbs.

8. Conclusion

In conclusion, based on its distribution, the 'adjective-like' word: (1) occupies the [+prdc] slot of a direct or indirect relative clause, and (2) functions as modifier of a noun, in which function it can itself have other

163

kinds of co-dependents. In addition to this syntactic evidence, the synchronic study of this language also gains strong support from language typology.

Notes

[1]On the contrary, then the so-called 'adjective' functions as a dependent of a N (in a relative clause construction), it should not be followed by the adverb *nah* or *pék*.

[2] This implies that his 'adjective verbs' are in relative clause constructions, either with nouns or with verbs as regents.

[3] Detailed analysis of relative clause constructions is given in Sak-Humphry (1992: 51, 81) and (1996: 36, 129).

[4]Further comprehensive analysis is needed for compound words. This is not covered in my dissertation — Sak-Humphry 1997)

[5]The words *khmauv dai* 'pencil' and *dai khmauv* 'pencil' are exceptions.

References

Ehrman, Madeline E. 1972. Contemporary Cambodian grammatical sketch. Foreign Service Institute, Washington, D. C.

Ehrman, Madeline E., Kem Sos and Lim Hak Khaean. 1974. Contemporary Cambodian: political institutions. Foreign Service Institute, Washington, D. C.

Huffman, E. Franklin. 1967. An outline of Cambodian grammar. Unpublished Ph. D. Dissertation, Cornell University. Ann Arbor, MI: University Microfilms.

_____. 1970. Cambodian system of writing and beginning reader. (Yale Linguistic Series), with the assistance of Chhom-Rak Thing Lambert and Im Proum. New Haven: Yale University Press.

_____. 1970. Modern spoken Cambodian (Yale Linguistic Series), with the assistance of Chhom-Rak Thong Lambert and Im Proum. New Haven: Yale University Press.

Indrambarya, Kitima. 1994. Subcategorization of verbs in Thai: a lexicase dependency approach. Unpublished Ph. D. Dissertation. University of Hawaii.

Jacob, Judith M. 1968. Introduction to Cambodian. Oxford and London: Oxford University Press.

Maspero, Georges. 1915. Grammaire de la langue Khmère. Paris: Imprimerie Nationale.

Nguyen, Dinh-Hoa. 1990. Vietnamese. The major languages of East and South-East Asia., ed. by Bernard Comrie, 49-68. London: Routledge.

Reid, A. Lawrence, and Savetamalya Saranya. 1997. An explanation for inconsistent word order typology in some Southeast Asian languages. A Festschrift for Vichin Panupong, ed. by Arthur Abramson and Kalaya Tingsabadh. Bangkok: Chulalongkorn University Press.

Sak-Humphry, Chhany. 1992. The syntax of nouns and noun phrases in dated pre-Angkorian inscriptions. Unpublished M. A. thesis, University of Hawaii. [revised in Mon-Khmer Studies XXII: 1-26 (1993).]

_____. 1994. Numeral classifiers in Modern Khmer. Paper presented to the Fourth Annual Conference of the Southeast Asian Linguistics Society.

_____. 1997. Khmer nouns and noun phrases: A dependency analysis. Unpublished Ph. D. dissertation, University of Hawaii.

Saranya Savetamalya. 1989. Thai nouns and noun phrases: A Lexicase analysis. Unpublished Ph. D. dissertation, University of Hawaii.

Starosta, Stanley. 1988. The case for lexicase: An outline of lexicase grammatical theory. London and New York: Pinter Publishers.

AN ACOUSTIC ANALYSIS OF HMONG ("KAIJUE MIAO") TONE[1]

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1.   Introduction

Languages use pitch in a variety of ways to encode linguistic meaning. Most familiar to English speakers is the intonational use of pitch, in which phrase-level patterns signal a variety of interactional meanings (semantic information) and the affective state of the speaker. Languages may also utilize pitch tonally. In these languages, pitch patterns, or "tones," extend over one syllable or word only and convey morphemic information, creating lexical and sometimes grammatical distinctions.

Pitch, whether linguistic or non-linguistic, is distinguished from fundamental frequency (Rose 1988). Pitch is perceptual, referring to the auditory sensation of ordering sound from high to low. Fundamental frequency is acoustic, referring to the physical reality underlying this ordering, specifically the number of complete variations in air pressure per second produced by the vocal folds opening and closing. Higher fundamental frequency values correlate to a large extent with higher perceived pitch, but they lack a one-to-one mapping due to other factors involved in the perception of pitch, such as vowel quality and amplitude (Couper-Kuhlen 1986:6; Durrant and Lovrinic 1995:278). Fundamental frequency and pitch are thus distinct, though related, concepts.

In a linguistic context, fundamental frequency (and pitch) plays a primary role in distinguishing between the different tones of a language. However, linguistic tone is not limited to fundamental frequency (and pitch), as the term would have one believe, but may encompass other features as well, such as duration, amplitude, and phonation type. In some languages, these features demonstrate distinctive patternings as well, supplying secondary or even primary phonetic information for tonal discrimination (Whalen and Yi 1992; Ratliff 1992:12).

Rigorous acoustic research is needed to determine the roles of fundamental frequency and other features in discriminating between tones in various tonal languages. Researchers such as Tseng (1990) and Howie (1976) have investigated the acoustic basis of tonal categories, particularly for Mandarin and dialects of Mandarin, providing much-needed insights and an empirical basis for subsequent studies. Many questions into the complex acoustic correlates of tone remain, pending further empirical research, particularly in non-Mandarin languages.

The language of focus in the research presented here is a previously unresearched Hmongic variety of southern China which I refer to as Kaijue

Miao.[1] The Hmongic languages, hereafter referred to as Miao,[2] are noted for their large tone inventories, often exhibiting six to eight lexical tones (*Zhongyang Minzu Yanjiusuo* 1987:2-4). Within the Eastern Guizhou branch, the branch to which Kaijue Miao belongs, eight lexical tones are common. My analysis of Kaijue Miao confirmed the presence of an eight-tone system in this variety as well. Sets of eight words composed of identical segmental sequencing of consonant and vowel but which nevertheless expressed eight distinctive meanings were found (see below). These distinctive meanings corresponded to eight distinctive tones, demonstrating the presence of eight lexical tones.

While Kaijue Miao clearly has eight distinct lexical tones, they could be distinctive for a number of different reasons acoustically. The objective of this present research was to examine the acoustic signal of each of the eight tones of Kaijue Miao in order to determine the distinctive acoustic features which are correlated with each tone. Specific research questions were as follows:

1. What are the duration and fundamental frequency patterns of Kaijue Miao tones?
2. Are there eight distinct duration patterns associated with the eight tones of Kaijue Miao?
3. Are there eight distinct fundamental frequency patterns associated with the eight tones of Kaijue Miao?

Eight distinct fundamental frequency patterns emerged, associated with the eight tones. Eight distinct duration patterns were not found. This study therefore concluded that fundamental frequency, but not duration, serves as a primary acoustic correlate of the eight lexical tones of Kaijue Miao. Phonation type,[3] while relevant to Miao, was beyond the scope of this present study, as was amplitude and the combined contribution of some or all of these features.

2.   Data and Methodology

Data for this research were collected in Guizhou, China in 1993. The speaker was a well-educated Miao man from Kaijue village who was employed in the provincial capital. Gathering data from multiple speakers was not possible.

Two minimal sets of words were recorded which demonstrate the eight tones of Kaijue Miao. Tone Set 1 is based on the segmental sequence [tɔ] whereas Tone Set 2 is based on [tʃuo]. Tone Set 1 in isolation as well as in a frame, with all its tonal variations, provided the basis for this analysis. Tone Set 2 supplemented the findings. For Tone Set 1, twelve

tokens in isolation and nineteen in a frame were analyzed. For Tone Set 2, six tokens in isolation were analyzed.

Orthographic representation, category number, and shape representation follow conventions used by Chinese researchers of Miao. Orthographically, Miao tones are indicated by choice of word-final consonant. These consonants correlate with tone category numbers, which represent historical similarity between different Miao varieties but not actual shape. The actual shape of each tone in a given variety is represented schematically by the five-point time-pitch graph system developed by Chao (1968).

The tone shapes presented below are similar to those given for the Yanghao variety of Miao, the chosen standard for the Eastern Guizhou branch (Zhang and Xu 1989), with modifications made to capture the unique shapes of Kaijue Miao tones. Kaijue Miao's chief departure from the standard is a switch in the shapes of Tones 3 and 5 (Jing Ping Li, personal communication). In addition, Tone 4 is heard as a mid-low level rather than a low level and Tone 7 as a high-low fall rather than a high-mid fall. Whether the Kaijue Miao shapes of these latter two tones represent an actual linguistic departure from the standard or simply a difference in notation is not known. The basic shapes of Tones 1 and 6 in Kaijue Miao are somewhat unclear based on fundamental frequency patterns observed in the data (to be discussed later) as well as inherent difficulties in determining "basicness" (Chan 1986), They are thus marked with a question mark.

Tones 4, 6, 7, and 8 are accompanied by distinct phonation.

TONE SET 1

Tone 1: ˧? [tɔ]	dob[4]	'girl's name'
Tone 2: ˥ [tɔ]	dox	'to be hunchbacked'
Tone 3: ˦ [tɔ]	dod	'to cut, to chop'
Tone 4: ˧ [tɔ]	dol	'to bump against'
Tone 5: ˩˥ [tɔ]	dot	'man's name'
Tone 6: ˩˧? [tɔ]	dos	'with'
Tone 7: ˥˩ [tɔ]	dok	'to take, hold, grasp'
Tone 8: ˥˩ [tɔ]	dof	'a small bench for one'

FRAME

˥	˦		˥	˦˨ʔ ˩
[moŋ]	[fʰɑɪ]	_____	[tʃiɪ]	[xʊ] [tʲʊ]
Mongx	hfaid		jiix	hveb diel.
You	translate		become	language Chinese.

Please translate _____ into Chinese.

TONE SET 2

Tone 1: ˦˨ʔ [tʃuo]   job   'to teach'

Tone 2: ˥ [tʃuo]   jox   'root'

Tone 3: ˦ [tʃuo]   jod   'back of the knee'

Tone 4: ˩ [tʃuo]   jol   'a treadle-operated tilt

                                              hammer for hulling rice'

Tone 5: ˧˥ [tʃuo]   jot   'tight'

Tone 6: ˨˩ʔ [tʃuo]   jos   'to pry something open or

                                              raise something up, using a
                                              lever'

Tone 7: ˥˩ [tʃuo]   jok   'to tie, fasten'

Tone 8: ˧˩ [tʃuo]   jof   'twisted, misshapen'

The voice data were recorded on a Sony WM-60 professional quality cassette tape recorder using a Crown PZM Sound Grabber microphone. The recordings were digitized using WaveLite digitizing software and analyzed on a Sun computer using Waves acoustic analysis software.

Waveforms and fundamental frequency (F_0) files were created for each tone and its tokens. Each token was then marked for the beginning and endpoints of the tone using the waveform and by listening to selected portions of the word. Fundamental frequency and duration measurements were collected, using a computer program developed for these purposes (Kibre 1996). The duration of each token was measured from the points marked and the average duration for each tone was determined. Fundamental frequency was measured by sampling every 5% along the length of the tone, beginning at 15% and ending at 85%. Percentage intervals rather than time intervals were used in the sampling of

fundamental frequency values in order to control for duration variability, and sampling was limited to the 15% to 85% range of the length of the tone in order to control for consonant influence. Average fundamental frequency values for each point were determined and composite representations of each tone were created. Standard deviations for duration and fundamental frequency means were calculated, capturing the range of values between which 66.66% of the data fall.

3.   Results

3.1   Duration

Upon examining the duration patterns of the eight tones of Kaijue Miao together with their standard deviation values, eight distinct duration patterns correlating with the eight tones did not emerge (Charts 1, 2, 3). Only Tone 8 could be clearly distinguished from every other tone on the basis of duration, as shown in Charts 1 and 2, but this distinction did not hold when placed in the frame (Chart 3). Tone 7 was marginally distinct from several tones other than Tone 8, but without consistency. Tones 1 – 6 were never distinguished from each other on the basis of duration. Note that the scale has been adjusted in Chart 3 to better represent the duration of the tones when in the frame, overall much shorter. Actual duration measurements for each tone may be found in the Appendix. Duration is measured in milliseconds (ms.), or thousandths of a second.

3.2   Fundamental Frequency

Fundamental frequency corresponds physiologically to the rate at which the vocal folds open and close, and is measured in cycles per second, or Hertz. Upon examining the fundamental frequency values with their standard deviations for the eight tones of Kaijue Miao, eight distinct patterns emerged which correspond to the eight tones. Fundamental frequency is thus a primary acoustic correlate in Kaijue Miao. These patterns distinguished between tones by creating tones of different shapes and of different ranges. Actual fundamental frequency measurements may be found in the Appendix.
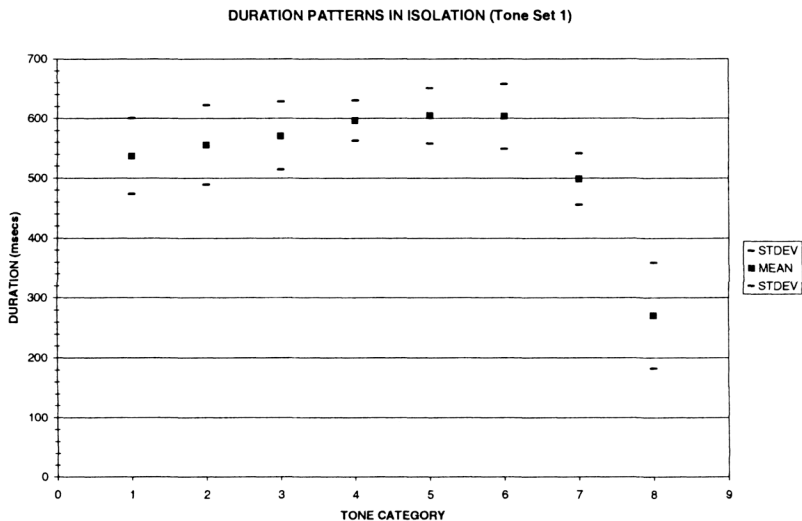
Chart 1. Plot of duration (on *y* axis) as a function of tone category (on *x* axis). Vertical bars denote ± 1 standard deviation.
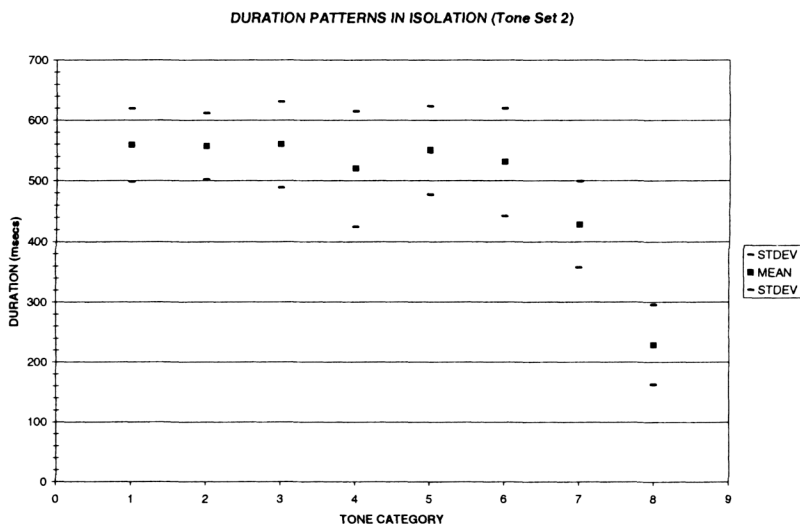
DURATION PATTERNS IN ISOLATION (Tone Set 2)

Chart 2. Plot of duration (on *y* axis) as a function of tone category (on *x* axis). Vertical bars denote ± 1 standard deviation.
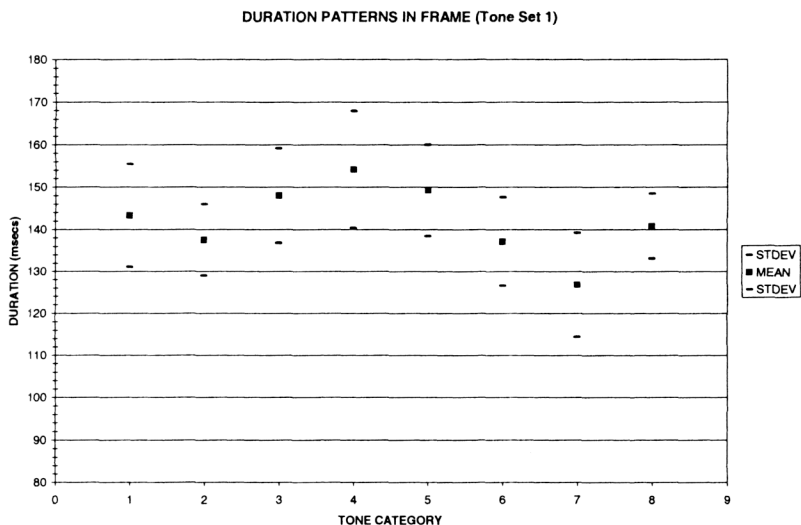
Chart 3. Plot of duration (on *y* axis) as a function of tone category (on *x* axis). Vertical bars denote ± 1 standard deviation.

The tones in isolation provide very straightforward evidence for the eight distinct fundamental frequency patterns. Beginning with the Tone Set 1 tones in isolation, we find that the level tones of Chart 4 are distinguished from the rising tones of Chart 5 as well as the falling tones of Chart 6 on the basis of shape (change in fundamental frequency or lack thereof over the course of the tone). Rising tones are similarly distinguished from the falling tones. Within each tonal shape, we find that each tone occupies its own unique fundamental frequency space and is thus distinguished from the other tones of the same shape. For example, in comparing the level tones, we find that the fundamental frequency of Tone 1 remains around 149 Hz., while Tone 2 has a typical fundamental frequency of around 195 Hz. Tone 3 remains around 168 Hz. and Tone 4 demonstrates a consistent fundamental frequency value of around 125 Hz. These fundamental frequency values and their standard deviations clearly distinguish these four tones of the same shape.
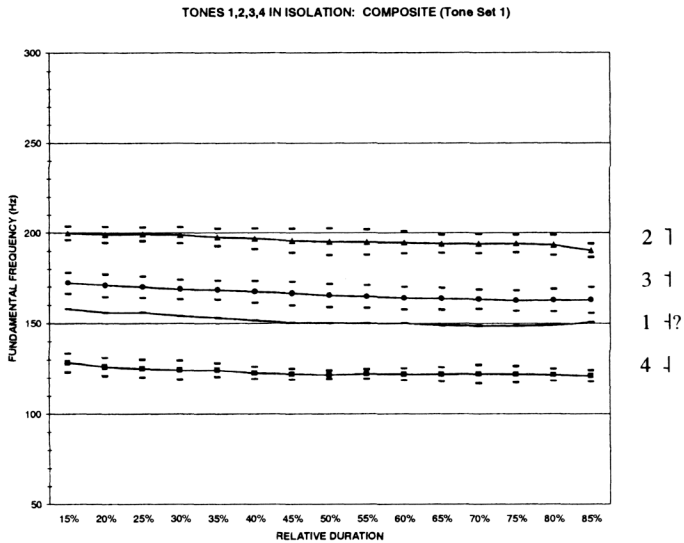
Chart 4. Plot of fundamental frequency (on y axis) as a function of relative duration (on x axis). The line curves correspond to the tone categories indicated on the right hand y axis.
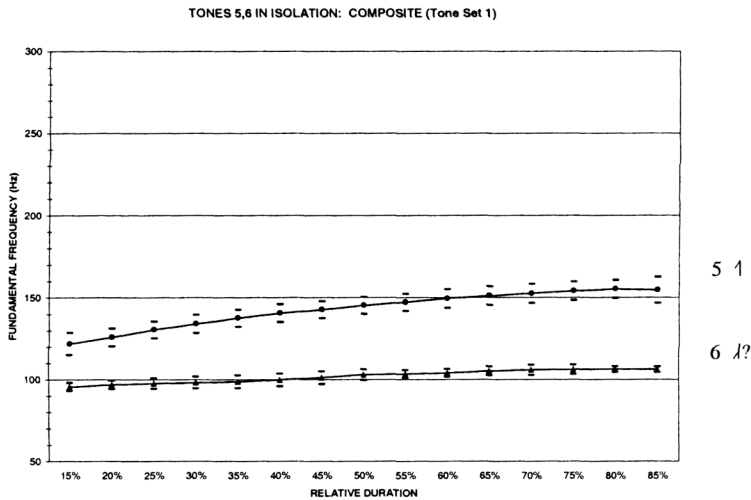
Chart 5. Plot of fundamental frequency (on y axis) as a function of relative duration (on x axis). The line curves correspond to the tone categories indicated on the right hand y axis.

174

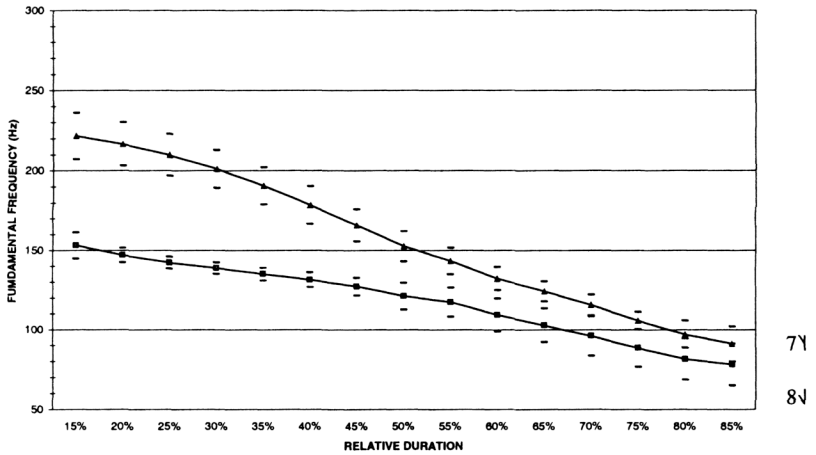TONES 7,8 IN ISOLATION: COMPOSITE (Tone Set 1)

Chart 6. Plot of fundamental frequency (on y axis) as a function of relative duration (on x axis). The line curves correspond to the tone categories indicated on the right hand y axis.

Tone Set 2 tones (isolation) demonstrate similar patterning to those of Tone Set 1 tones in isolation (Charts 7, 8, and 9).

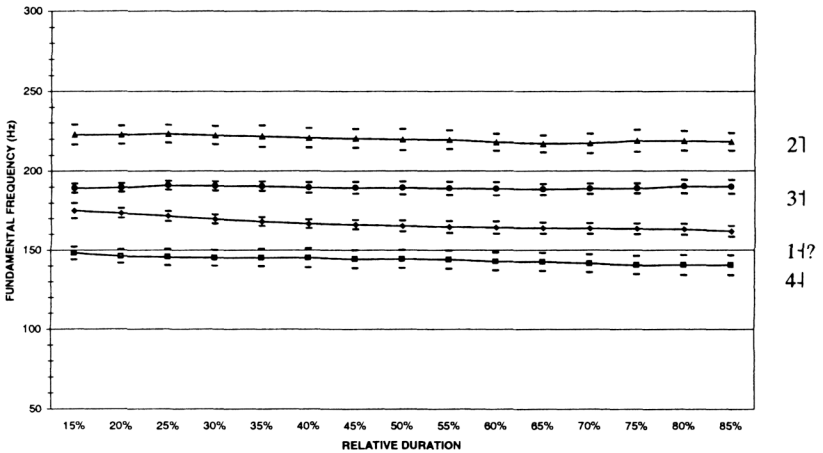TONES 1,2,3,4 IN ISOLATION: COMPOSITE (Tone Set 2)

Chart 7. Plot of fundamental frequency (on y axis) as a function of relative duration (on x axis). The line curves correspond to the tone categories indicated on the right hand y axis.

175

TONES 5,6 IN ISOLATION: COMPOSITE (Tone Set 2)

Chart 8. Plot of fundamental frequency (on *y* axis) as a function of relative duration (on *x* axis). The line curves correspond to the tone categories indicated on the right hand *y* axis.

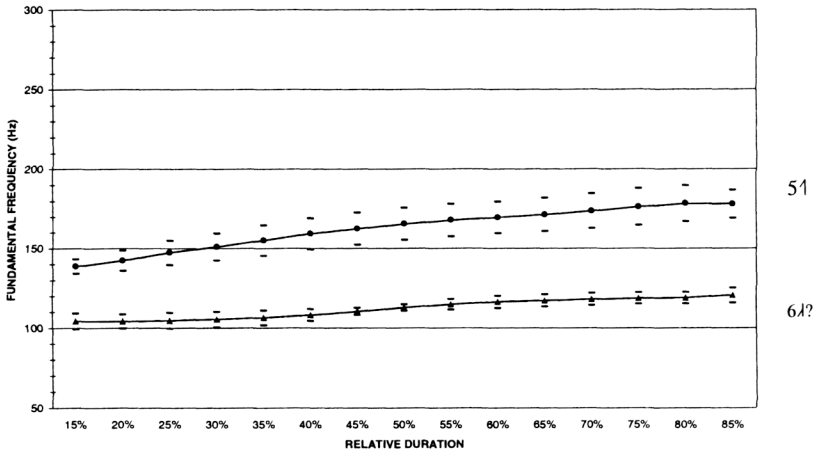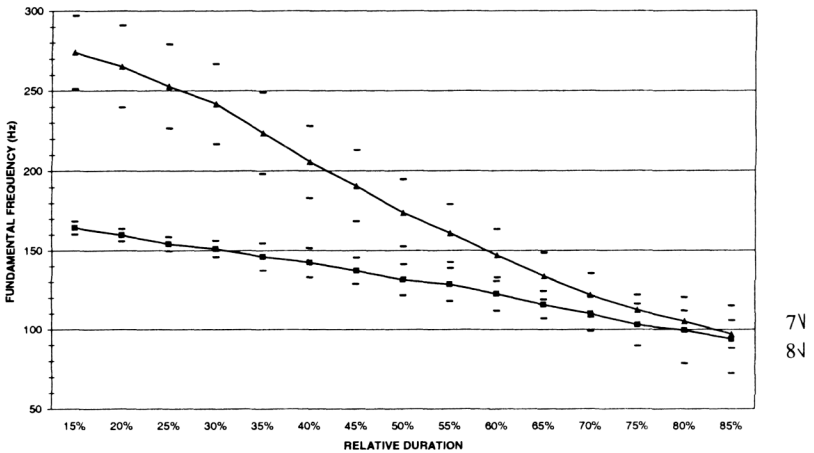**TONES 7,8 IN ISOLATION: COMPOSITE (Tone Set 2)**

Chart 9. Plot of fundamental frequency (on *y* axis) as a function of relative duration (on *x* axis). The line curves correspond to the tone categories indicated on the right hand *y* axis.

176

Tone Set 1 tones in the frame demonstrate again that eight distinct fundamental frequency patterns exist which correlate with the eight tones (Charts 10, 11, 12). Three tones warrant some brief comments. The uneven contour charted for Tone 7 on Chart 12 is due to an increase in glottalization on this tone when in the frame, making extraction of fundamental frequency values difficult. Tones 1 and 6 show variations in shape when in the frame. Tone 1, a level tone in isolation, drops by 39 Hz. in the frame (or 23 Hz. measured from 30% in, to further control for consonant influence). It is thus charted with the clear falling tones on Chart 12. Tone 6, a rising tone in isolation, rises only slightly in the frame (+5 Hz., starting 30% in), bringing into question its status as a rising tone. The increased perceptibility of small variations of fundamental frequency in the lower ranges (Durrant and Lovrinic 1995:270) may compensate for the slightness of the rise. It continues to be charted as a rising tone here. Regardless of choice of basic shape for Tones 1 and 6 and the factors which create the variations observed, these tones are still clearly distinct from all other tones on the basis of fundamental frequency.

TONES 2,3,4 IN FRAME: COMPOSITE (Tone Set 1)

Chart 10. Plot of fundamental frequency (on *y* axis) as a function of relative duration (on *x* axis). The line curves correspond to the tone categories indicated on the right hand *y* axis.

177

Chart 11. Plot of fundamental frequency (on *y* axis) as a function of relative duration (on *x* axis). The line curves correspond to the tone categories indicated on the right hand *y* axis.
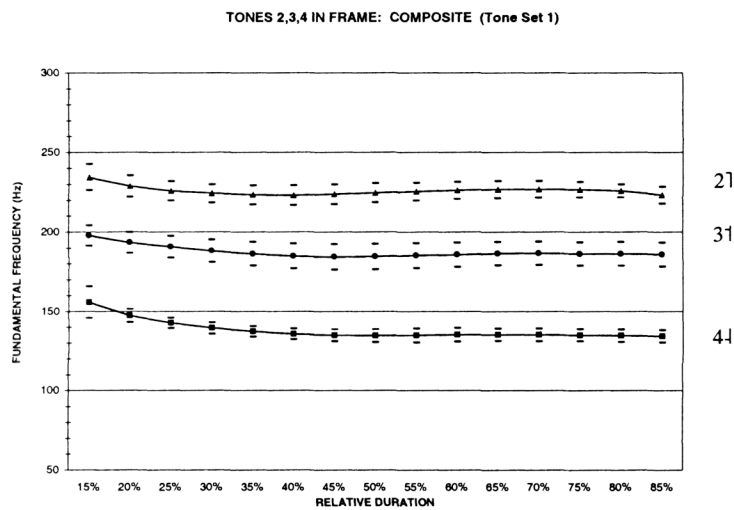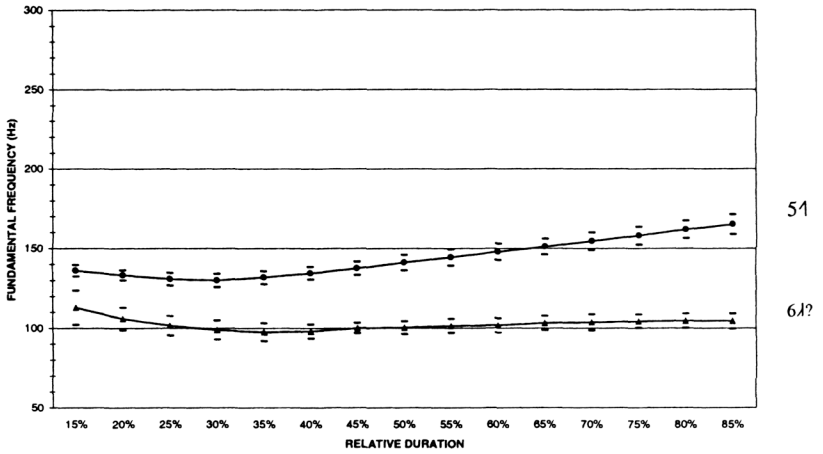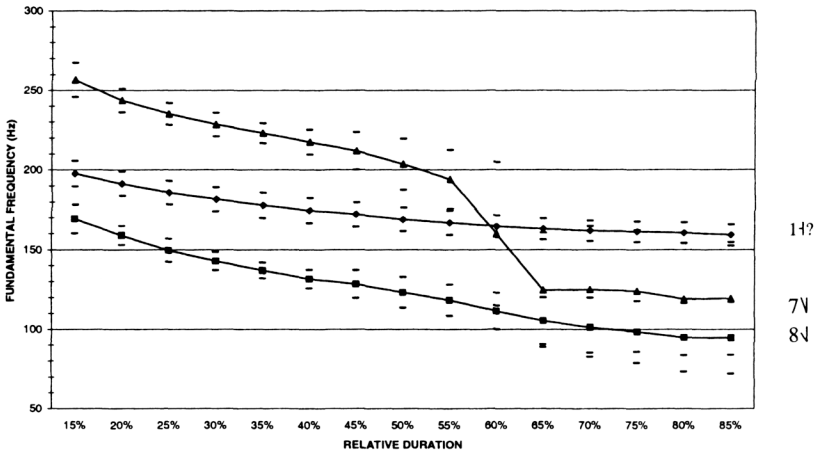
Chart 12. Plot of fundamental frequency (on *y* axis) as a function of relative duration (on *x* axis). The line curves correspond to the tone categories indicated on the right hand *y* axis.

4.   Conclusions

This acoustic phonetic study of the eight tones of Kaijue Miao concluded that fundamental frequency but not duration is a primary acoustic correlate of tone in Kaijue Miao. Eight distinct fundamental frequency patterns were found which correlate to the eight tones. Eight distinct duration patterns were not found. Phonation type and amplitude, though relevant, were beyond the scope of this present study. Data from additional speakers of Kaijue Miao would serve to verify the conclusions of this research, presently a case study. While no claims can be made on the basis of this study regarding the roles of these acoustic features in the perception of tone, it seems highly plausible that they contribute significantly, given the correlation between the eight fundamental frequency patterns and the eight lexical tones.

In addition to contributing to our understanding of the acoustic phonetic basis of tone itself, studies such as this provide an empirical foundation for future in-depth investigations into the related areas of tone sandhi phenomenon, perception of tone, and the complex interactions between tone and other elements, such as segments, phonation types, and stress and intonation. Acoustic studies also have much to contribute to research into the typology of tonal systems, cross-dialectal comparisons, historical reconstruction, and theories of language change. Finally, as Asian tonal systems are less understood than their African counterparts, studies such as this which focus on Asian tone make a unique contribution to our understanding of tonal phenomenon.

Notes

[1]Hmong forms part of the Hmong-Mien (Miao-Yao) language family and is comprised of three main branches: Eastern Guizhou, Western Hunan, and

Sichuan-Guizhou-Yunnan, the latter encompassing varieties spoken outside China. Kaijue Miao (my term) forms part of Eastern Guizhou branch, Northern subdivision. It is spoken in Kaijue village, Xijiang Zhen, Leishan County, SE Guizhou Miao-Dong Autonomous Prefecture, Guizhou Province, P.R. China. Given the great diversity of Miao, even within linguistic subdivisions where substantial variation may not yet be reflected in designation, I have chosen to refer to this Miao variety by its village name, Kaijue, in order to uniquely identify and locate it.

[2]As I research varieties spoken in China, working alongside Chinese linguists, I have chosen to use the Chinese designation "Miao" rather than "Hmong," the preferred term outside China, though I certainly appreciate the reasons for the use of the designation "Hmong."

[3]Laryngeal features, such as "breathy" and "creaky" voice.

[4]Orthography in this paper is based on the standard system developed for the Eastern Guizhou branch of Miao, with slight modifications appropriate to Kaijue Miao phonology.

Appendix

1.   Mean Duration (in milliseconds)

	1	2	3	4	5	6	7	8
	˧ʔ	˥	˦	˩	˧	˨ʔ	˩˩	˩˧
Iso (Set 1)	537	555	571	596	604	603	498	271
Iso (Set 2)	559	557	560	520	550	531	428	229
Frame (Set 1)	143	137	148	154	149	137	127	141

2.   Mean Fundamental Frequencies (in Hertz)

	1	2	3	4	5	6	7	8
	˧ʔ	˥	˦	˩	˧	˨ʔ	˩˩	˩˧
Iso (Set 1)								
15%	153	200	172	128	122	96	222	153
85%	145	190	163	121	155	106	91	78
Change	-8	-10	-9	-7	+33	+10	-131	-75
Iso (Set 2)								
15%	175	223	189	148	139	104	274	164
85%	162	218	190	140	178	121	97	94
Change	-13	-5	+1	-8	+39	+17	-177	-70

180

Frame (Set 1)

15%	198	234	198	156	136	113	257	169
85%	159	223	186	134	165	104	119	95
Change	-39	-11	-12	-22	+29	-9	-138	-74

30%	182	139	99
Change from 30%	-23	-5	+5

References

Chan, Marjorie K.M. 1986. On the status of "basic" tones. University of California working papers in phonetics 63.71-94.

Chao, Yuan-Ren. 1968. A grammar of spoken Chinese. Berkeley: University of California Press.

Couper-Kuhlen, Elizabeth. 1986. An introduction to English prosody. Forschung and Studium Anglistik 1. Tubingen: M. Neimeyer.

Durrant, John and Jean Lovrinic. 1984. Bases of hearing science, 2nd ed. Baltimore: Williams and Wilkins.

Howie, John. 1976. Acoustical studies of Mandarin vowels and tones. Cambridge: Cambridge University Press.

Kibre, Nicholas. 1996. In-house computer program for management of fundamental frequency and duration. University of California at Santa Barbara.

Ratliff, Martha. 1992. Meaningful tone: a study of tonal morphology in compounds, form classes, and expressive phrases in White Hmong. Northern Illinois University Center for Southeast Asian Studies, Monograph Series on Southeast Asia, Special Report No. 27.

Rose, Philip John. 1988. On the non-equivalence of fundamental frequency and pitch in tonal description. Prosodic analysis and Asian linguistics: to honour R.K. Sprigg, ed by D. Bradley, E. Henderson, and M. Mazaudon, 55-82. Pacific Linguistics C-104.

Shen, Xiao Nan. 1990. The prosody of Mandarin Chinese. Berkeley: University of California Press.

Shih, Chilin. 1988. Tone and intonation in Mandarin. Cornell phonetics lab working papers 3.83-109.

Tseng, Chiu-yu. 1990. An acoustic phonetic study on tones in Mandarin Chinese. Institute of History & Philology Academia Sinica, Special Publications No. 94. Taipei.

Wang, Fushi (ed.) 1985. *Miaoyu Jianzhi* [A sketch of the Miao language]. *Zhongguo Xiaoshu Minzu Yuyan Jianzhi Congshu* [Brief Account of the Languages of China's Minority Nationalities Series]. Beijing: Minzu Chubanshe [Nationalities Publishing House].

Whalen, Douglas, and Yi Xu. 1992. Information for Mandarin tones in the amplitude contour and in brief segments. Phonetica 49.1-23.

Xu, Yi. 1994. Production and perception of coarticulated tones. Journal of the acoustical society of America 95.2240-2253.

————. 1997. Contextual tonal variations in Mandarin. Journal of phonetics 25.61-83.

Zhang, Yong Xiang and Shi Ren Xu (eds.) 1989. *Hmub Diel Cif Dieex, Hveb Qeef Dongb. Miao-Han Cidian, Qiandong Yuyan* [Miao-Han Dictionary, Eastern Guizhou]. Guiyang, Guizhou: Guizhou Minzu Chubanshe [Guizhou Nationalities Publishing House].

Zhongyang Minzu Xueyuan Miaoyaoyu Yanjiusuo [Miao-Yao Language Research Institute of the Central Institute of Nationalities]. 1987. *Miaoyaoyu Fangyan Cihuiji* [Miao-Yao Dialect Glossary]. Beijing: Zhongyang Minzu Xueyuan Chubanshe [Central Institute of Nationalities Publishing House]

CLAUSE-FINAL MODALS IN MAINLAND SOUTHEAST ASIA

Andrew Simpson*

1. Introduction

This paper sets out to examine the properties of modals such as <u>dai</u> in Thai. <u>Dai</u> is unusual in that it occurs in some position *following* the verb, whereas other modals in the language precede the VP as is elsewhere common in V-O languages:

1)   *khaw   khian   **dai***
         he   write   can
         'He can write.'

2)   *khaw   **doong/aat-ca**   pay*
         he   must/may   go
         'He must/may go.'

Further investigation reveals that this curious positional property of <u>dai</u> is also attested in a highly similar way in many other languages of the region. In SVO Cambodian, Vietnamese and Cantonese modal verbs occur as expected before the lexical predicate with a single interesting exception - a modal with the same meaning as <u>dai</u> is found to follow the main verb (Hmong is also reported to pattern in this way):

3)   *goa'at   roo-ut   **baan***   Cambodian
         he   run   can
         'He can run.'

4)   *anh-ta   den   **duoc***   Vietnamese
         he   come   can
         He can come.

5)   *kui   lai   dak*   Cantonese
         he   come   can
         'He can come.'

The repeated occurrence of such a marked paradigm in so many neighbouring languages might strongly seem to indicate borrowing and transfer. The suspicion that the modals in these languages are indeed related is further strengthened by the observation that they *all* have parallel homophones, lexical verbs with the meaning 'get/have':

6) | *phom* | ***dai*** | *botbaat* | *thii* | *dii* | | (Thai) |

    I   got   role   Rel   good

    'I got a good role.'

7) *k'nyom* *jong* ***baan*** *bee-a* *moo-ay* *dorp* (Cam.)

    I   want   get   beer   one   bottle

    'I want to get/have a bottle of beer.'

8) *toi* ***duoc*** *tho* *cua* *gia-dinh* *toi* (Viet)

    I   got   letter   family   me

    'I got a letter from my family.'

9) *ngoh* ***dak*** *saam-man* *je* (Cant.)

    I   have   3-dollarsonly

    'I only have $3 left.'

If the modal series is indeed connected via borrowing, one clearly needs to ask both what the original source might have been and how the differences in phonetic form among the languages may be given explanation. We would like to suggest that the relevant hypothetical source was actually Middle Chinese and that there is a highly plausible route of transfer out of Middle Chinese and through the languages in the group.

    Although forms like Cantonese (5) do not occur in Modern Mandarin, they are commonly found up until the 13th century in Middle Chinese (*see* Sun 1996):

10) *yi* *ren* *ji* ***de*** Middle Chinese

    one   person play   can

    'One person can play (it).'

In (10) one observes the occurrence of a post-verbal potential modal de, essentially just as in the patterns noted earlier. Now, given the assumption that the Tai people originated from S.E. China and subsequently migrated southwestwards between the 11th and 13th centuries, it is clear that they were in the Chinese-speaking area precisely at the time when this post-verbal de was common, and migrated away just before its decline, a highly suggestive fact. We therefore propose that de was borrowed into Thai as dai. There are also reasons to believe that the pronunciation of de in Middle Chinese was actually more like /dei/ (*see* Sun 1996), so the posited phonetic change to /dai/ is hardly major.

    Concerning the modal in Cambodian 'baan', this may be taken to have actually been borrowed from Thai, which developed a second modal with the same positional property as dai pronounced /pɛn/ (as indeed suggested in Huffman 1973). As for Vietnamese duoc, the occurrence of a

syllable-final voiceless stop is obviously similar to that in Cantonese <u>dak</u>, and arguably can be said to reflect either borrowing from Chinese at a period in the Middle Ages when the use of syllable-final stops was known to be more widespread, or borrowing from one of the southern Chinese dialects such as Cantonese which retained such voiceless stops longer. The centuries of contact and exchange between Cambodia and Thailand and Vietnam and China also clearly provide a straightforward route for the hypothetical transfer.

So, there would indeed seem to be quite reasonable motivation for assuming that a process of borrowing and onward transfer has here resulted in the creation of a regional typological feature of some significant importance - the occurrence of a *post*-verbal modal in a set of otherwise fully regular head-initial V-O languages. We now attempt to probe the syntactic properties of this modal, concentrating primarily on Thai where we believe the vital clues to understanding the paradigm in general are located.

2. Thai

Above we have noted that the position of the potential modal in the languages considered is rather exceptional, essentially for the reason that cross-linguistic evidence consistently shows modals occurring to the left of the lexical predicate in head-initial languages. Recently it has been suggested that this evidence is in fact so pervasive that a 'universal template' may be argued for, with modal and aspectual verbs all occurring in a pre-determined hierarchical ordering dominating the VP-predicate (Cinque 1996). The occurrence of a group of modals in some position to the right of the verb as found in Thai, Viet etc is consequently not only unexpected and but also a strong theoretical challenge to this universalist hypothesis. Below we subject these modal structures in Thai to some careful scrutiny to see what kind of structure may be assigned to them and how this may bear on the universalist issue.

One may quickly discount the possibility that the modals here are some kind of verbal suffix similar to the *-e-* potentiality marker in Japanese (as in: *hanas - e - ru* - speak - Pot - Tense 'can speak'); the fact that objects, adverbs and other elements intervene between the main verb and <u>dai</u> indicates that the latter is a fully independent modal element:

11) *raw   jee   <u>kan</u>   <u>prung-nii</u>   dai*
     we   meet   together tomorrow   can
     'We can meet tomorrow.'

A variety of evidence indicates however that there is more to the post-verbal position of the modal than initially meets the eye and it is not simply VP-final but somehow 'higher' in the clause. First of all, consider

the patterning of *yes-no questions*; these are answered in the positive by repetition of the leftmost or 'highest' verbal element in any string, as in (12):

12) *phom   doong   pai mai* A: *doong* B: *pai
     I   must   go Q   must go
     'Must I go?'   'Yes.'

In dai-sentences it is found that an answer-form consists in the repetition of dai rather than the linearly first lexical verb, indicating that it is dai which is the hierarchically higher verbal element rather than the lexical verb, despite the surface ordering:

13) *khaw phuut phasaa thai **dai** mai*   A: ***dai*** B: **phuut*
     he speak language thai can   Q   can   speak
     'Can he speak Thai?'   'Yes.'

The position of *sentential negation* in dai-sentences offers a further indication of the structure of the clause; sentential negation occurs immediately before dai, and following the lexical verb and its object/adverbs:

14) *khaw   phuut   phasaa thai   **mai**   dai*
     he   speak   language thai   NEG   can
     'He cannot speak Thai.'

If one makes a standard assumption that sentential negation occurs external to and higher than the VP, then it is not possible to suggest that there is a VP constituent in (14) containing both the lexical verb and dai, as this would then simultaneously also contain the sentential negation. Consequently dai would again *not* seem to be inside the VP.

The patterning of constituent negation adds a further informative clue. In (15) the negation *only* has scope over the underlined string and critically *not* over dai:

15) *khun   **mai**   pai   kap   khaw   dai*
     you   NEG   go   with   him   can
     'You can (choose) not to go with him.'

In order to account for this, one must assume that negation in (15) does not 'c-command' dai, and hence that the underlined string in (15) is a constituent which excludes dai.

In view of the above, one might instead entertain the possibility that all of the material which precedes dai is actually predicated of dai as its

186

subject, hence that dai-sentences are in fact *sentential subject* structures. Such an analysis would indeed be able to account successfully for all of the phenomena noted thus far. However, despite a certain initial plausibility, there are reasons to believe that a sentential subject approach is also not appropriate here. To begin with, root modals clearly impose *selectional restrictions* on their subjects; (16) is accordingly odd in both Thai and English as the modal dai/can/be able requires a +animate subject:

16) *??fon   dok   dai*
     rain   fall   can
     ??'The rain is able to/can fall.'

Considering examples such as (15) above, it is the pronoun   khun 'you' which satisfies the selectional restrictions of dai. This should however technically not be possible if the pronoun is analyzed as being inside a sentential subject, because there is no possible predicational (hence selectional) relation between a predicate X and an element which occurs *inside* the subject of X. (16) below is illustration of this - 'be good' may not be predicated of 'John', hence (16) cannot entail (17):

16) *[That John is coming tomorrow] is good.*
17) John is good.

Further evidence arguing against a sentential subject analysis relates to *extraction asymmetries* which can be noted when comparing dai-sentences with clear sentential subject structures. Relativization (or topicalization) from the latter is fully unacceptable as seen in (18) (_ marks the extraction-site):

18) **phuu-chaai thii [loon khop_] may   dii ko khuu..*
     man   Rel she be-with Neg good is
     'The man who that she sees is bad is..(e.g. John)'

If dai-sentences were sentential subject structures, one would expect that extraction of an element preceding dai should result in a violation equivalent to that in (18). However, parallel relativization (or topicalization) with dai-sentences is perfectly acceptable, indicating that they are *not* structurally equivalent to sentential subject structures:

19) *phuu-chaay thii loon khop _   may dai ko khuu..*
     man   Rel she see   Neg can is
     'The man who she may not date/see is ... (John)'

187

The same contrasts are found where an object of the lexical verb seems to have been moved to a sentence-final position. Such extraction is completely unacceptable from clear sentential subjects but fully grammatical in dai-sentences:

20)   *[khaw beet-pheey _] mai   dii   khwaam-lap
        he   reveal   Neg   good   secret
        *'[That he revealed _] is not good the secret.'

21)   kwaa   ja   thaai   _ dai   [sak   phaap-nung] .....
        before Irr   take   can   Prt   picture-one
        Before I could take a single picture,...

Finally, relative scope facts in sentences containing more than one modal similarly argue against a sentential subject analysis. In (22) the modal doong 'must' obligatorily takes scope over dai:

22)   khun doong phoo phuut phasaa thai dai nit-nooy
        you must suffice speak language thai can a little
        'You must be able to speak a little Thai.'

Were all the material preceding dai in (22) to be analyzed as a sentential subject, then doong would not be expected to be able to take scope over dai and its scope should instead be limited to the sentential subject itself (as in: '[That John must leave] is possible.' where must does not take scope over be-possible). Once again this strongly suggests that dai-sentences have a structure quite different from that of sentential subjects.

2.1 The proposal: VP-raising
We would now like to propose that the many syntactic properties observed above may be neatly captured by assuming that dai-sentences such as (23) are in fact derived from underlying forms where the modal selects a rightward VP-complement, as in (24):[1]


23)   khaw   phuut   phasaa thai   dai
        he   speak   language thai   can
        'He can speak Thai.'

24)

```
              DeP
             /\
          /    \
       Spec    De'
       khaw    |\
       (Sub)  De   VP
       he_i   dai  /\
              can  / [PRO phuut phasaa thai]
                   PRO_i  speak Thai
```

We suggest that (23) is derived from (24) via two applications of movement. The overt pronominal subject will raise to the canonical subject position ('SpecIP' in Chomskyan terms) and the predicate VP will undergo movement to a position between the subject and <u>dai</u>, informally this being something akin to 'inner topicalization'. This is schematized linearly in (25) and hierarchically overleaf in (26):[2]

25) $khaw_i$ $[_{VP} phuut\ phasaa\ thai]_k$ t_i dai t_k

Such an analysis captures the following assumptions/patterns:

a) <u>dai</u> imposes selectional restrictions on its subject; this is effected in a regular 'Spec-head' predicational relation in (24).

b) <u>dai</u> is underlyingly the verbal element which is hierarchically higher and therefore the element which occurs in answer-forms.

c) There is no sentential subject structure; object extraction may take place when the VP is in its complement position, allowing for a straightforward account of the contrast with attempted object extraction from genuine sentential subjects.

189

26)   IP
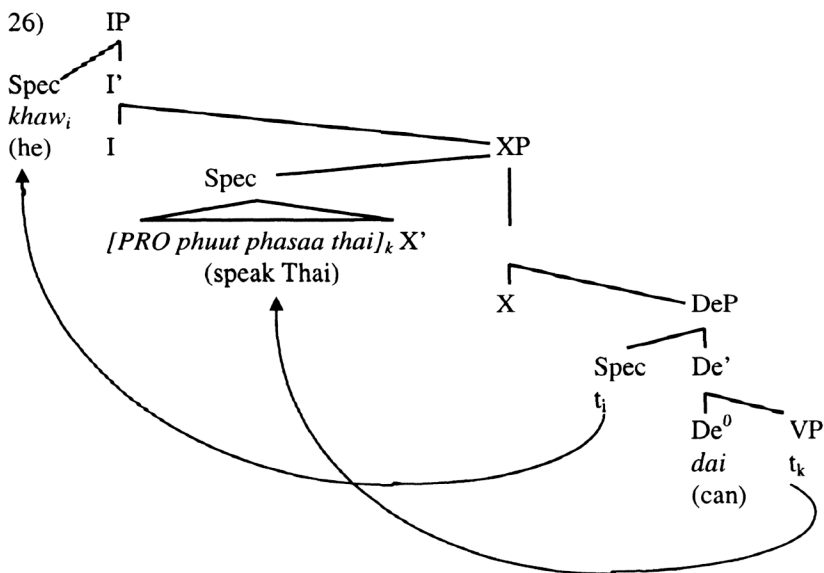
d) The structure posited allows a simple account of the negation facts; sentential negation occurs between the XP and DeP, hence higher than the VP. The fact that the lexical verb and its object appear higher than sentential negation is simply due to the movement of the VP. 'Constituent negation' will be base-generated between $\underline{De}^0$ and the VP and raise together with the latter. Consequently it will not c-command dai (even in its surface raised position), and so will not have scope over dai.

e) Sentences such as (22) with a second modal verb obligatorily taking scope over dai may be assigned a structure in which doong/must heads a higher modal phrase occurring between IP and the XP, the resulting c-command relations between the two modals in such a structure automatically accounting for their relative scopes.

The analysis also allows for an explanation of two further phenomena - the licensing of Negative Polarity Items (NPIs) and VP-Ellipsis. Wh-question words in Thai may be licensed as NPIs in negative dai-sentences but not in corresponding negative sentential subject structures indicating another clear difference between these forms, this seen below in (27-28):

27)   khaw   [phuut   aray]_i   mai   dai   t_i
        he   say   what   Neg   can
        'He can't say anything.'

190

28)   *[khaw   phuut   <u>aray</u>]*   *mai*   *dii*
            he   say   what   Neg   good
not: 'That he says nothing is good.'
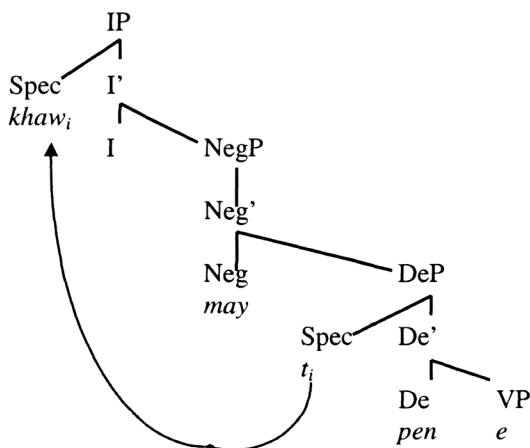only: 'What is it good that he doesn't say?'

If interpretation as an NPI requires a c-commanding licensor, this interpretation of <u>aray</u> in (27) may be licensed when <u>aray</u> is in the VP c-commanded by Negation *prior* to the hypothesized movement of the VP. The sentential subject in (28) by contrast will not have raised from within the scope of Negation and so an NPI reading of <u>aray</u> is not available.

     Consider also ellipsis structures such as (29):

29)   *Lek <u>phuut phasaa jiin</u> dai, tae Dam-na, khaw mai pen*
            Lek speak Chinese   can but Dam-Top she   Neg can
            'Daeng can speak Chinese, but Dam can't.'

Here the underlined string in the first conjunct has been ellided from the second.[3] If one makes the standard assumption that what undergoes ellipsis must always be a syntactic constituent, the possibility of structures such as (29) argues both against a sentential subject analysis of <u>dai</u>-sentences and one in which <u>dai</u> is taken to be in some lower position within the VP. For the latter view, prior to ellipsis, the VP of the second conjunct should consist in the string *[*VP *phuut phasaa jiin + pen]*. It should not be possible to ellide just the upper half of this VP *phuut phasaa jiin* leaving behind simply *pen* as the former would not be a syntactic constituent in such an analysis, yet *pen* may indeed be stranded in these structures. In a sentential subject account, the (sentential) subject of the second conjunct prior to ellipsis should be *khaw phuut phasaa jiin*.[4] Here again one might not expect that it should be possible to ellide just a sub-part of this constituent *phuut phasaa jiin*, yet this is the string which clearly seems to have been ellided in (29). For the analysis suggested here, (29) is really just a very typical example of VP-ellipsis, the string *phuut phasaa jiin* is a VP complement to <u>dai</u> which does not include <u>khaw</u> (nor *pen* of course). This VP is ellided straightforwardly from the position marked *e=empty* in the second conjunct's structure, as below:

30)

```
              IP
            /\
        Spec   I'
        khaw_i /\
          ↑   I    NegP
          |        |
          |       Neg'
          |        /\
          |      Neg    DeP
          |      may    /\
           \        Spec   De'
            \        t_i    /\
             \            De    VP
              _____pen    e
```

Finally and importantly, in a structure such as (26) <u>dai</u> is no longer taken to be an exceptional modal occurring in some highly irregular VP-internal position but rather inserted in a position dominating the VP alongside all other 'regular' modal verbs; Cinque's universalist hypothesis would therefore seem to be successfully maintained (or at least not disproved by <u>dai</u>). What is exceptional about <u>dai</u> and in need of explanation is not its base-generated position but rather the movement of its complement VP, and to this we now turn in section 2.2.
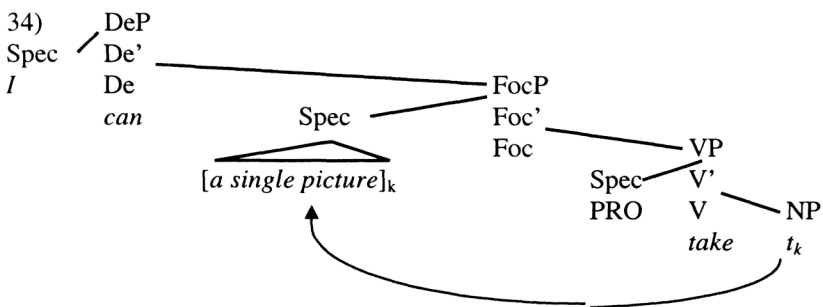
2.2 Motivations for VP-raising
Above we have offered a wide variety of syntactic arguments as support for the raising analysis proposed. The question now arises as to *why* this VP-movement should take place, what might be its motivation? We believe a plausible explanation relates to the particular *informational structure* of <u>dai</u>-sentences. Earlier we noted that it is possible for the object of the lexical verb to occur clause-finally *after* <u>dai</u> - see example (21), rather than immediately after the lexical verb as in all other examples. This may only happen however if the object is strongly *focused*. Furthermore if the object is so focused, it *must* occur in this position and is highly unnatural-unacceptable preceding <u>dai</u>. In addition to this it may also be noted that if no focused object follows <u>dai</u>, i.e. if <u>dai</u> is final in the clause, then <u>dai</u> itself automatically carries a focal stress. What can be concluded from this is that <u>dai</u>-sentences would always seem to be associated with some kind of focus. We would now like to suggest that these focus-effects are indeed critically responsible for the 'exceptional' behaviour observed in <u>dai</u>-sentences and that the motivation and function of the proposed VP-raising is principally to *de-focus* the predicate by moving it away from the final focus position, allowing for either <u>dai</u> itself or alternatively an object following <u>dai</u> to receive the focus intonation.
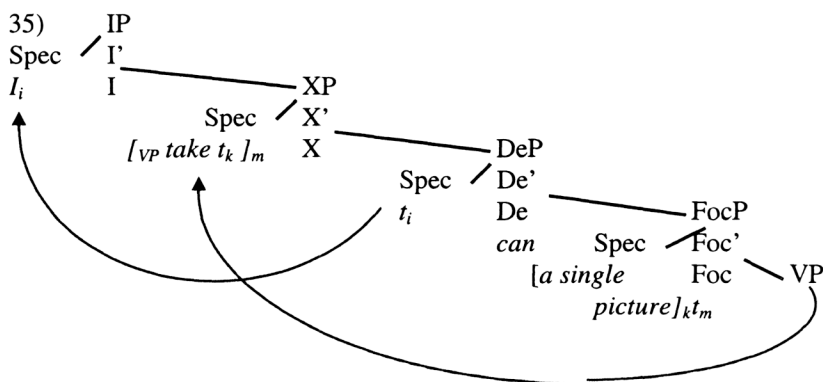
The pragmatic/stylistic force of dai-sentences is then to emphasize the possibility/ability/permission of carrying out a certain action (stress on dai itself) or to emphasize a particular element relating to this possible action (stress on a final object as in (21)). The VP predicate in a sense then represents *pre-supposed* information, while the new/focused information is the affirmation of the positive (or negative) possibility of the content of the predicate (or some element related to the predicate). Such a view of dai-sentences is arguably supported by the fact that they occur with a high degree of frequency in negative sentences, questions and acts of granting permission, all instances where it may be argued that the content of the predicate is quite likely to be information presupposed in the discourse. Indeed this presuppositional nature of the predicate can be better captured by adding a stress to the modal in English translations, e.g:

31)   *He CAN'T speak Thai.*   (negative sentence)
32)   *CAN I invite him along?*   (question)
33)   *You MAY indeed go to the movies.* (permission)

Once the modal is stressed (as dai would be in Thai), one can only interpret the predicates here as being presupposed.

If raising of the VP then occurs as proposed in order to de-focus it, we also need to explain how it is possible for a focused object to occur after dai - i.e. if the entire VP raises past the modal, how is it that the object can remain in final position (as in (21))? We would like to suggest that what is ultimately exceptional about the modal dai is that it actually selects for a 'focus projection' as its complement, and that when a focused object follows dai it has in fact raised out of the VP to the Specifier of this FocusPhrase. This focus-movement is then followed by VP-raising to the position preceding dai, as indicated in the sequence (34) and (35) (using English glosses for the relevant Thai words in (21)):

34)   DeP
Spec / De' _____
1   De   FocP
          can   Spec   Foc'
                                      Foc   VP
                [*a single picture*]$_k$ Spec   V'
                                              PRO   V   NP
                                                    take t_k

35)
```
        IP
   Spec / I'
   Iᵢ      I ——————————— XP
    ↑       Spec / X'
         [ᵥₚ take tₖ ]ₘ   X ——————————— DeP
                      Spec / De'
                       tᵢ     De ——————————— FocP
                             can    Spec ⟋Foc'
                                 [a single   Foc ⟍ VP
                                   picture]ₖtₘ
```

3. Middle Chinese and Old Chinese

Above we have developed an analysis of <u>dai</u>-sentences which might seem to offer a principled and coherent account of the otherwise puzzling post-verbal position of this modal, one which furthermore turns out to be quite in line with Cinque's universalist hypothesis. Earlier in section 1 we suggested it seems likely that these structures in Thai have in fact been borrowed from Middle Chinese, and hence that their syntactic properties may well be those of early '<u>de</u>'-constructions. We now turn briefly to the latter to see if they may provide any additional evidence for the proposed account.

We suggest that there is data present in two basic forms which do indeed strongly support the conclusions of section 2. First of all, if we consider the patterning of the object of the lexical verb in Middle Chinese <u>de</u>-constructions, it appears to closely mirror the distribution found in Thai and therefore arguably be dictated by the same presupposition/focus distinctions. Where an object is indefinite and unfocussed it occurs sandwiched between the lexical verb and <u>de</u> precisely as in Thai (also note the position of negation parallel to Thai):

36) *shi*   *qie*   *[yao*   <u>*shou]*</u>   *bu*   ***de***
     cause   wife   wave   hand   Neg   can
     'It caused the wife not to be able to wave her hand.'

Strongly focused objects are however found to occur *after* <u>de</u>, again exactly as in Thai:

37) *cheng*   ***de***   <u>*ge*   *shenme-bian*   *shi?*</u>
     succeed   can   Cl   what   matter
     'What can one accomplish?'

The patterning is thus entirely as expected if Thai <u>dai</u>-constructions have indeed been borrowed from Middle Chinese and if focus is an important determining factor in the syntax of these structures.

194

A second set of data heavily supporting the analysis of section 2 comes from <u>de</u>-constructions found earlier still in Old Chinese. Throughout section 2 a variety of synchronic theoretical arguments all appeared to converge on the conclusion that <u>dai</u>-sentences are derived from structures where the modal selects a VP complement to its right, this VP subsequently undergoing raising for reasons relating to focus. Turning to <u>de</u>-constructions in Old Chinese the significant discovery is made that at this period in its history <u>de</u> in fact *preceded* the VP, showing precisely what has been argued to be the underlying form of <u>de</u> and <u>dai</u>-sentences in Middle Chinese and Thai, and indicating that the VP/predicate clearly was a (rightward) complement of <u>de</u> in its origins.

38) *Zikuai* *bu* *de* *[*_{VP} *yu* *ren* *yan]*
     Zikuai Neg permit give other Yan
     Zikuai is not allowed to give others the state of Yan

39) *ni* *de* *[*_{VP} *ru* *men* *ye]*
     you can enter door Prt
     You can enter.

Returning once again to Middle Chinese, Sun (1996) reveals that such <u>de</u>-initial (<u>de</u>-VP) structures actually remained present for some time alongside other post-verbal <u>de</u>-final constructions. There was consequently a period in Middle Chinese when both types of <u>de</u>-VP and VP-<u>de</u> structures simultaneously occurred. One may therefore suggest that the later <u>de</u>-final (VP-<u>de</u>) type found only in Middle Chinese (and the form which has by hypothesis been borrowed into Thai, Viet etc) developed from the earlier <u>de</u>-initial (<u>de</u>-VP) forms as a stylistic variant triggered by the informational-discourse reasons outlined in section 2 - the rightward VP complement became raised whenever there was a need to de-focus it. This raising was clearly optional in early Middle Chinese (when it may be assumed that not all <u>de</u>-sentences necessarily had predicates whose content was presupposed), but later became obligatory, at least in Thai, as part of the meaning of such constructions.

Consequently then diachronic data from Old and Middle Chinese strongly seem to bear out and support the analysis developed on the basis of Thai and can be suggested to indicate that a period in which there existed competing stylistic forms ultimately led to the establishment of one of these as the sole and exclusive option, conceivably as a classic result of 'over-use' of this particular variant.

4. Summary
We now close the paper with a brief summation of its main points. The paper began by suggesting that there exists in mainland S.E. Asia a

significant paradigm of post-verbal modals connecting Thai, Cambodian, Viet, Hmong and Cantonese, with a source which ultimately goes back to Middle Chinese. We then pointed out that the apparent clause-final nature of the potential modal would seem to constitute important empirical evidence against Cinque's recent universalist hypothesis on clausal architecture. Selecting Thai as a general hypothetical representative of the paradigm for further detailed investigation, a range of syntactic tests subsequently all suggested that this initial conclusion was however most probably incorrect. Synchronic evidence indicates that a VP predicate linearly preceding the modal behaves in all syntactic respects as if it were a rightward complement of the modal. We therefore argued that a natural analysis of the patterning is to assume that the VP is in fact base-generated to the right of the modal and later raised to its surface position. We then went on to show that this possibly rather unexpected hypothetical movement of the VP may actually be ascribed a clear and simple motivation relating to the informational structure of sentences containing the modal; the VP instantiates presupposed information in these cases and undergoes raising in order to remove it from a final focus position where new information is critically encoded. Section 3 added further evidence in support of this analysis, showing that the VP was indeed a rightward complement of the modal back in Old Chinese, and that this later led to a period where it optionally occurred either before or after the modal, quite arguably as a result of stylistic movement triggered for focus-related reasons. Ultimately then an in depth examination of what initially appeared to be a strong set of counter-examples to Cinque's universalist hypothesis has revealed that they may actually be seen as fully according with such a theory, stressing the need for careful research before potentially significant conclusions are drawn and also positively highlighting the considerable value of comparative cross-linguistic and historical investigations.

Finally we would like to note that the analysis developed here primarily on the basis of Thai and Old/Middle Chinese is also tentatively suggested to be valid in its underlying fundamental design for other members of the paradigm such as Viet, Cambodian etc. Viet and Cantonese are investigated elsewhere in Simpson (1997) and an account of certain differences relating to the position of sentential negation and varying constraints on the distribution of the object is proposed. Essentially it is suggested that the freer positioning of the object found in Viet and its post-modal occurrence in Cantonese are the results of historical re-analysis away from a focus-related construction.

Notes

[1] The projection is labeled 'DeP' as it is intended to be not just Thai-specific but to occur in all the languages under consideration here; 'De' is

chosen in recognition of the origins of the modal. 'PRO' is a null pronominal whose reference is controlled by the overt subject <u>khaw</u>.

[2] In (26) I stands for Infl and is intended to be the locus of the finiteness of the clause. The landing-site of the movement is not formally identified, and XP could instantiate any of the higher modal projections which we believe are present in the structure, as per Cinque (1996).

[3] In the second conjunct we use <u>pen</u> rather than <u>dai</u> just for contrast; as noted earlier, <u>pen</u> is parallel to <u>dai</u> in syntax and in meaning.

[4] Note that we have included a topic <u>Dam-na</u> in the second conjunct so that <u>khaw</u> may not be analyzed as a topic and therefore 'outside' of the subject.

References

Cinque, G. 1996. Adverbs and the Universal Hierarchy of Functional Projections. Ms.

Huffman, F.E. 1973. Thai and Cambodian – A Case of Syntactic Borrowing? Journal of the American Oriental Society. 93: 488-509.

Sun, C. 1996. Word Order Change and Grammaticalization in the history of Chinese. Stanford.

Simpson, A. 1997. Light Predicate Raising in East and S.E. Asian Languages. Ms, SOAS, London.

HRÊ CONTACT AND THE ORIGINS OF THE HAROI RESTRUCTURED REGISTER SYSTEM: A CASE OF SHARED SOUND CHANGES[1]

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Introduction

Southeast Asia provides some instructive examples of the respective roles played by internal and external factors in the development of register complexes and tone systems while in contact with languages with such systems. In the case of Haroi, it provides a clear example of external language contact initially resulting in a register system, and then evolving into a restructured register system. In the Haroi developments, the internal factors, the oft-mentioned 'language-internal pressures and imbalances', have played a minor, almost insignificant role, while the external contact has provided both the impetus and the directionality for the restructuring. In this data, the role of language-internal 'imbalances' and 'pressures' is limited largely to constraining the paths by which the restructuring occurred.

This discussion of the evolution of Haroi incorporates much of my earlier work on Haroi, but is much more specific in its discussion of the precise contact situation and the precise changes involved; it also goes beyond earlier work first in recognizing that certain Haroi changes predate contact with Hrê and then in correlating the post-contact changes specifically with the changes found in Smith's (1972) reconstruction of Proto-North-Bahnaric (PNB), a correlation that requires minor reworking of some of Smith's reconstructions, particularly the interaction between vowel changes and phonation types.

Modern Haroi is a Chamic language now located in the highlands of Vietnam. It is a member of the Chamic subgroup of Western Malayo-Polynesian, a group found predominately along the coast and in the highlands of Vietnam (e.g. Haroi, Cham, Northern Roglai, and so on), but also on Hainan Island just off mainland China (Tsat), and in northern Sumatra (Acehnese). The Chamic languages have been under intense influence from Mon-Khmer languages, as is obvious from the borrowing patterns and the direction of the internal restructuring.

Pre-Haroi Chamic restructuring

The Haroi restructuring involves two stages. Long before becoming Haroi, the pre-Proto-Chamic precursor of Haroi underwent a major prosodic restructuring under the influence of the Mon-Khmer languages then found along the coast of Vietnam.

Stress and the syllable structure. The pre-Chamic Austronesian speakers who arrived on the coast of Vietnam most likely brought with them a largely disyllabic lexicon with predictable stress: in disyllabic forms stress was penultimate unless the vowel of the initial syllable was a shwa; when that was the case, the stress fell on the final syllable (cf. modern Bahasa Indonesia or Bahasa Malaysia). Under the influence of Mon-Khmer languages, this canonical preference for penultimate stress was replaced by a preference for final stress. Thus, by early proto-Chamic (PC) most, although not necessarily all, disyllables had final stress.

Register complexes and voice quality. Register complexes were also acquired sometime after the arrival on the coast of Vietnam, with the pre-Haroi voice quality component (phonation distinctions) of register consisting of breathy voiced vowels after voiced obstruents and modal (or, clear) voiced vowels after the remaining consonants. It is these voice quality distinctions on the vowels that produced the vowel splitting so distinctive of Haroi historical phonology.

The Haroi internal paths of change

Modern Haroi has what Huffman (1976) termed a restructured register system. In the case of Haroi, between PC and modern Haroi the following chain of events has occurred: (1) certain classes of initials led to distinctive phonation differences on the following vowels, that is, a register system with voice quality differences; (2) the voice quality differences on the vowels produced vowel distinctions, that is, led to a register system with vowel registers; and, (3) the voice quality distinctions that originally conditioned the vowel splits disappeared, leaving behind a large number of now unconditioned vowel distinctions; in Huffman's terms, it became a restructured register system with the proliferation of vowels associated with restructured register systems.

Voice quality and the vowel splitting patterns

The remaining changes occurred within the history of Haroi while Haroi[2] was in contact with Hrê.

Modern Haroi reflects a major realignment and splitting of the original PC vowel system. The major vehicle for these multiple reflexes is voice quality-induced vowel splitting. Under the influence of tense voice (the phonation induced by the proto-voiceless obstruents) certain monophthongs were lowered and certain diphthongs had their onsets lowered. And, under the influence of breathy voice (the phonation induced by the proto-voiced obstruents), certain monophthongs were raised and certain diphthongs had their onsets raised.

Table 1: Restructured register and Haroi vowel splitting

PC initial classes:	PC voiceless obstruents >	all other PC initials >	PC voiced obstruents >
Voice quality:	tense voice >	modal voice >	breathy voice >
Effects on vowels:	high vowels lower >	no effect >	low and mid vowels raise >
Result:	proliferation	of	vowels

For monosyllabic words, the various vowel types interacted with the manner of articulation of the PC syllable-initial consonant to produce the modern vowel splitting patterns. These vowel splitting patterns are summarized in Table 2 (below).

Transparency and phonation spreading

Table 1 does not, however, account for all the vowel proliferation. In specific cases, the voice quality induced by the onset of the presyllable spreads through main-syllable sonorant onsets. As a result, it is not the onset of the main syllable but the onset of the presyllable that correlates with the voice quality of the main syllable. Haroi spreading patterns are simple: the main-syllable initial sonorants are transparent to spreading from all obstruents in the pretonic syllable.

Table 2: Consonant types, vowel classes, and vowel splitting

	voiceless obstruents > tense voice	glottalized obstruents, voiced aspirates, & sonorants	voiced obstruents > breathy voice
high vowels; *-əŋ > *-ɨŋ	(onset) lowered; > -əŋ	unchanged	unchanged
centering diphthongs: *ua > *oa *ia > *ea	unchanged	unchanged	raised and backed: **-ia > -ɨa; **-ua- > -ua; -ʊ- ∠m, -ʔ
mid *ɛ; *ə; *ɔ; *-ɛị > *-ɔ̌i	unchanged	unchanged	raised: ɪ; ɨ; ʊ (u); -ɨi [(fronted]
low vowels	unchanged	unchanged	developed -ɨ- onset

Thus, with a minor exception noted below, if the main syllable begins with a sonorant, the phonation class of the main syllable is determined by the initial consonant of the pretonic syllable, not the main syllable: if the pretonic syllable begins with a voiced obstruent, the main syllable vowels reflect the effects of this voiced obstruent, while if the pretonic syllable begins with a voiceless obstruent other than *s or *h, the main syllable vowels reflect this voiceless obstruent (cf. Burnham 1976; Lee 1977:88). If the main syllable onset is other than a sonorant, spreading does not occur.

Haroi external contact with Hrê and its influence

The evidence of Hrê contact is not controversial. Hrê has undergone vowel realignments quite parallel to those undergone in Haroi. The evidence can be culled, with some minor readjustments of the

202

reconstructions, from Smith's (1972) reconstruction of Proto-North-Bahnaric (PNB), which includes Hrê. With minor modifications in the vowel reconstructions, it becomes evident that, with the Hrê vowels that changed height, the Hrê reflexes of PNB vowels had lowered under tense voice and raised under breathy voice.

As Table 3 shows, the PNB high vowels have lowered in Hrê under tense voice, the same phonation type that led Haroi high vowels to lower.

Table 3: Hrê high vowels lowered under tense voice

PNB (Smith, modified)	Hrê	
*tum	tôm	'all'
*bič	beč	'fat [v]'
*c(h)uy	čôy	'plant rice'
*pih	pêh	'pound rice'
*asih	asêh	'horse'
*rih	rêh	'play [instrument]'
*taqnih	taneh	'earth, soil'
*(q)bul	bo	'lizard; gecko; salamander'
*kačĭyh	kačêh	'sneeze'

And, as Table 4 shows, the PNB mid and low vowels have raised in Hrê under breathy voice, the same phonation type that led Haroi mid and low vowels to raise.

Table 4: Hrê mid and low vowels raised under breathy voice

PNB (Smith, modified)	Hrê	
*čèm	čìm	'bird'
*klèč	klìč	'deaf'
*phèw	phèw	'happy'
*adrày	adrì	'pestle'
*hày	hì	'day; sun'
*plày	plì	'fruit; egg; round object clf.'

In short, the Haroi and the Hrê changes are not just parallel, but the Haroi changes took place while in intense contact with Hrê.

Table 5: PNB *-ay Hrê reflexes: raising under breathy voice

PNB (Smith, modified)	Hrê	
*bray	bray	'thread'
*katayh	katayh	'hip'
*may	may	'sister in-law; elder sister'
*baŋay	maŋay	'people'
*adrày	adrì	'pestle'
*hày	hì	'day; sun'
*plày	plì	'fruit; egg; round object clf.'
*qbàyh	bìh	'snake'

Notice that when the PNB *-ay was under other than breathy voice, the Hrê reflexes remain *-ay, but when the PNB *-ay was under breathy voice, the high vowel reflex occurs.[3]

The conjectures about the earlier sociolinguistic situation are somewhat speculative, but it was likely a combination of some shift accompanied by long-term bilingualism. At the earliest stages, Haroi would still have been a dialect of the then prestigious Cham language, and thus some speakers of Hrê may have shifted to Haroi. Since then, however, Cham has suffered a considerable loss of prestige, and at some point the roles became reversed with the Haroi now assimilating to the Hrê, a reversal of the earlier situation.

In any case, two things are well-attested: Ethnographically, the Haroi have been heavily influenced by Bahnar, in particular by the Hrê. Under these influences, Haroi has undergone a set of changes typologically parallel to the changes in Hrê. Specifically, during this period of social and linguistic contact, the Haroi vowel system has been realigned, coming to resemble the Hrê vowel system.

Conclusions

The Haroi case nicely illustrates the respective roles played by external language contact and by internal paths of change: the external contact has provided both the impetus and the directionality for the changes, while the language internal structures have provided constraints on the potential paths for the changes.

As a corollary to the primary role played by contact in this and other Haroi changes, the major Haroi changes have not come about gradually. Rather, the opposite is true: since the major changes in Haroi

came about with the onset of intense contact, the major changes are characterized by short periods of rapid, assimilative restructuring, beginning with the onset of intensive contact and followed by periods of relative stasis and more minor changes—continuing until the next significant period of contact. The non-contact induced changes are far more minimal.

Similar restructurings, powered by contact situations and presumably abrupt rather than gradual, are found throughout Southeast Asia (for example, Thurgood 1992, 1996). In fact, it would be reasonable to conclude that, in the Southeast Asian linguistic area, it is contact that has provided the impetus for most of the major changes with language-internal factors only influencing the paths by which such changes take place.

Finally, the most interesting part of this particular change may be that it seems to have been a change in part shared both by Haroi and Hrê, that is, given both the timing of the changes and their striking similarities, it looks like the best way to view the changes is as being one that was shared by the Haroi and the Hrê speakers, that is, for monolingual Hrê speakers it of course occurred in their Hrê but for those Haroi speakers bilingual in Hrê, it occurred not only in their Hrê but the change was also extended to their Haroi. Thus, in this sense, the change was shared between the two languages.

Notes

1   This paper involves significant extensions and reworkings of my earlier work on Haroi.

       Symbols used: forms prefaced by a single asterisk (*) are proto-forms; forms followed by -i have an irregular initial, by -f have an irregular final, by -v have an irregular vowel, and by -t have an irregular tone. As the historical phonology is better understood, at least some of these apparent irregularities should disappear, while others will remain puzzles.

2   The name Haroi itself may simply be a borrowed variant of the Mon-Khmer Hrê.

3   Although these particular patterns appear quite clear, much reworking of Smith (1972) is needed to fully make sense of the interaction of vowel changes and phonation types.

References

Burnham, E. C. 1976. The place of Haroi in the Chamic languages. MA thesis, University of Texas at Arlington.

Goschnick, H. and A. Tegenfeldt-Mundhenk. 1976. Haroi dictionary. SIL. Huntington Beach, CA. 325. ms.

Goschnick, H. 1977. Haroi clauses. In Thomas, et al. *Papers in South East Asian Linguistics. No. 4. Chamic Studies*. Canberra: Pacific Linguistics. Series A, No. 48. 105-124.

Gregerson, Kenneth J. 1976. Tongue root and register in Mon-Khmer. In *Austroasiatic Studies I*, edited by P. N. Jenner, L. C. Thompson, and S. Starosta. Oceanic Linguistics special publication no. 13. Honolulu, Hawaii. 323-70.

Huffman, F. E. 1976. The register problem in fifteen Mon-Khmer languages. In *Austroasiatic Studies*, edited by P. N. Jenner, L. C. Thompson, and S. Starosta. Special publication of Oceanic Linguistics no. 13. 2 volumes. Honolulu, Hawaii: University of Hawaii Press. I:575-90.

Lee, E. W. 1966. Proto-Chamic phonologic word and vocabulary. Ph.D. Indiana University. 67-3690.

_____. 1974. Southeast Asian areal features in Austronesian strata of the Chamic languages. Oceanic Linguistics XIII.1-2:643-668.

_____. 1977. Devoicing, aspiration, and vowel split in Haroi: evidence for register (contrastive tongue-root position). In Thomas, et al. *Papers in South East Asian Linguistics. No. 4. Chamic Studies*. Canberra: Pacific Linguistics. Series A, No. 48. 87-104.

Smith, K. D. 1972. *A phonological reconstruction of Proto-North-Bahnaric*. (Language Data, Asian-Pacific series, no. 2). Santa Ana, CA: SIL. 109.

Tegenfeldt-Mundhenk, A. and H. Goschnick. 1977. Haroi phonemes. In Thomas, et al. *Papers in South East Asian Linguistics. No. 4. Chamic Studies*. Canberra: Pacific Linguistics. Series A, No. 48. 1-15.

Thomas, D. D., E. W. Lee, and D. L. Nguyen. 1977. *Papers in South East Asian Linguistics. No. 4. Chamic Studies*. Canberra: Pacific Linguistics. Series A, No. 48.

Thurgood, G. 1992. The aberrancy of the Jiamao dialect of Hlai: speculation on its origins and history. In *First Annual Meeting of the Southeast Asian Linguistics Society, 1991*, edited by M. Ratliff and E. Schiller. Tempe: Arizona State University Southeast Asian Studies Publication Program. 417-433.

_____. 1996. Language contact and the directionality of internal 'drift': the development of tones and registers in Chamic. *Language*. 71,1:1-31.

OPEN QUOTIENT AND SKEWNESS OF THE LARYNGOGRAPH WAVEFORM AS MEASURES OF PHONATION TYPES AND LARYNGEAL ARTICULATIONS IN WA[1]

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1 Introduction and objectives

This paper is a road-test of two methods, one established and one new, of assessing the relationship between the laryngograph (electroglottograph, EGG) waveform and phonation types and glottal consonants in the Wa language. The work is a pilot study carried out in the preliminary stages of a larger-scale research project into the pronunciation of Wa.

The new method of measuring the laryngograph waveform proposed here provides a means of quantifying phonation type for descriptive purposes, allowing vowels and laryngeal consonants to be treated identically. This study is a sneak preview of work in progress examining the phonetics of phonologically contrastive phonation types in Wa. Relatively few studies have been undertaken which make use of the laryngograph for linguistic phonetic purposes (e.g. Lindsey et al. 1992). It is hoped that this work may add to the growing repertoire of descriptive techniques available to the phonetician, given the current broad interest in the phonology, history and nature of tones and phonation types in Asian languages. For example, this work could serve as an alternative or complement to inverse filtering techniques or acoustic methods of investigating the linguistic use of phonation types.

2 The Wa languages

Wa belongs to the Palaungic branch of Northern Mon-Khmer (Diffloth 1980). Wa speakers number roughly one million, and are located in an area which Gérard Diffloth has described as the Waic corridor (Diffloth 1980:5), between the Salween and Mekong rivers in the Shan States of Burma and China's Yunnan province.

3 Register in Mon-Khmer

Mon-Khmer register is a binary phonological contrast which is associated with a variety of phonetic phenomena, among them pitch-based tone, as in Kammu (Svantesson 1983) and Blang (Zhou and Yan 1983); phonation type, as in Wa (Zhou and Yan 1984, Maddieson and Ladefoged 1985, Theraphan 1988, Svantesson 1993) and Mon (Theraphan 1987:161; 1990:12), or some combination of these features. Eugénie Henderson (1952:151), who was first to use the term register to refer to Mon-Khmer languages, describes the registers of Cambodian in terms of voice quality, pitch and larynx height.

209

A connection between Mon-Khmer register and tongue-root position was asserted by Kenneth Gregerson (1973). Register is described in terms of two contrasting 'laryngeal attitudes' by Jim Matisoff (1973:76), which he calls 'tense-larynx syndrome' and 'lax-larynx syndrome', which involve the tongue root and supra-glottal cavity as well as the larynx. But the articulatory domain of the Mon-Khmer register contrast is primarily, if not exclusively, the larynx.

4 Phonation types and laryngeal articulations in Wa

The phonological inventory of Wa speech sounds includes the following laryngeally articulated possibilities:

1) a four-way contrast in initial stop consonants
    i)   unvoiced unaspirated   /p/
    ii)   prenasalised voiced unaspirated   /^{n}b/
    iii) unvoiced aspirated   /p^h/
    iv) prenasalised voiced aspirated   /^{n}b^h/

2) the binary registral phonation type contrast
    i)   'creaky' phonation   /a̰/
    ii) breathy phonation   /a̤/

3) syllable final consonants
    i)   none (open syllable)   / /
    ii) glottal stop /ʔ/   /ʔ/
    iii) glottal fricative /h/   /h/

The term 'creaky' is applied to Wa with some hesitation, since for many speakers, including the one used in this study, the phonation type of this register may be more accurately labelled as tense, pressed or even modal. The term 'creaky' is used throughout the paper nonetheless.

The following set of syllables illustrates the size of the phonological burden borne by the larynx in Wa. Keeping constant the supralaryngeal articulatory sequence of bilabial plosive initial consonant plus open unrounded /a/ vowel, and changing only laryngeal activity though each syllable, the matrix of eighteen syllables shown Table 1 is generated. The registral contrast is not found in syllables beginning with aspirated consonants, after which vowel phonation is creaky.

pa̤	pa̰	ⁿba̤	ⁿba̰	pʰa̤	ⁿbʰa̤
pa̤h	pa̰h	ⁿba̤h	ⁿba̰h	pʰa̤h	ⁿbʰa̤h
pa̤ʔ	pa̰ʔ	ⁿba̤ʔ	ⁿba̰ʔ	pʰa̤ʔ	ⁿbʰa̤ʔ

Table 1: Eighteen possible Wa syllables, the phonological heterogeneity of which is preserved by laryngeal articulations alone.

For reasons of project size management, the effect on phonation type of initial consonant voicing contrasts is left outside the scope of this paper, which concentrates instead on the phonation type characteristics of the Wa vowel registers and laryngeal consonants.

5 A phonation type continuum

Despite some involved descriptive systems which have been developed to account for the complex agility of the vibrating larynx (see, for example, Catford 1964; Laver 1980:93-140), for descriptive purposes in a South East Asian linguistic context it is generally only necessary to define a three-way classification of phonation: creaky, modal and breathy (Theraphan 1988:321). In such an analysis, only two of these three categories are required to describe Wa vowels: creaky and breathy. Ladefoged points out that in Wa the difference between the phonation types is not as extreme as in other languages whose contrastive use of phonation type has been investigated experimentally, such as Jalapa Mazatec and !Xóõ (Ladefoged et al. 1988:314).

The Wa consonant inventory makes use of phonological oppositions which are laryngeally articulated: initial stop consonant voicing contrasts and final glottal consonants. In Wa, the glottal stop, which term properly describes the cessation of vocal fold vibration, is in fact realised as a short period (typically about 50ms) of true, aperiodic creaky phonation. In utterance-final position, vocal fold vibration may slow to an indistinct stop. The Wa glottal fricative is realised as a period of breathy phonation of similar length.

Breathy phonation in Wa is associated with breathy vowel register and with glottal fricative consonants, while relatively creakier phonation is associated with the creaky vowel register and glottal stops. The acoustic similarity in Wa of breathy phonation to glottal fricatives and of creaky phonation to glottal stops becomes apparent if spectral profiles are compared. The relative amplitudes of the first and second harmonics (H1, H2) have been shown to be an index of phonation type in Wa (Svantesson 1993:103) and in other languages which make phonologically contrastive use of phonation types (Ladefoged et al. 1988). The following illustrations derived from syllables in the corpus of recordings used for this study make this point clear:
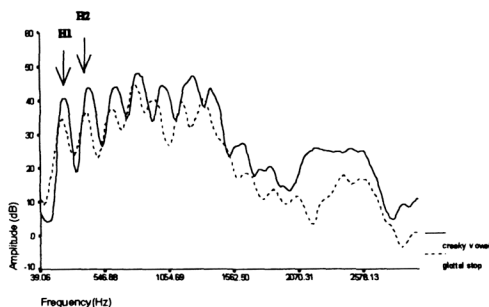
Figure 1 Overlaid spectral profiles (40 Hz b/w, 256-point, 20KHz sample rate, up to 3KHz shown) of Wa syllable-final creaky /a̰/ and of syllable final /ʔ/, realised phonetically as [a̰].
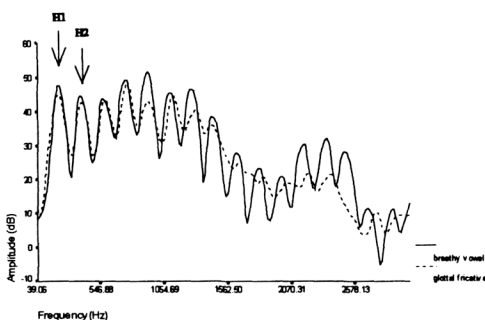

Figure 2 Overlaid spectral profiles (40 Hz b/w, 256-point, 20KHz sample rate, up to 3KHz shown) of Wa syllable-final breathy /a̤/ and of syllable final /h/, realised phonetically as [a̤].

Notice in the spectra of a Wa vowel with modal phonation and of a Wa glottal stop shown in Figure 1 that the amplitude of the first peak representing the first harmonic (H1) is higher than the second peak, indicating that the amplitude of H1 is greater than the second harmonic (H2). The reverse is true in Figure 2, which depicts the spectral profiles of a vowel with breathy phonation and of a glottal fricative. The overall formant structure of all four spectra in these illustrations is similar because they are all associated with an /a/ vowel produced by the same speaker.[2]

Potentially conflicting phonation types may be found within a single syllable, and it is with the aim of describing this that this paper explores a hypothetical phonation type 'continuum' which may be invoked to describe the range of phonation types found in Wa, be they associated with vowels or consonants. For instance, breathy vowel /a̤/ and creaky consonant /ʔ/ adjoin one another in the syllable /pa̤ʔ/, while in the syllable /pa̰h/, creaky vowel /a̰/ is followed by breathy consonant /h/.

Creaky and breathy phonation types are placed at opposite ends of the continuum, the extremes of which are not absolutes, since no absolute measure of

212

phonation type is possible, but rather defined by the measurements which emerge from the study. This is a descriptive device conceived for maximum ease of application, exploiting the acoustic and articulatory similarity which pairs glottal stops with creaky phonation and glottal fricatives with breathy phonation in Wa. Such an apparently simplistic treatment of the complex phenomenon of phonation type is justified on two grounds. Firstly, the simplicity of the method mirrors the simplicity of the limited palette of phonological phonation type oppositions in Wa which underlies the phonetic reality. Secondly, the simplicity of this method is an advantage if it is consistently reliable and provides useful information, even though it the precise relationship between the measurement and the physiological reality has not yet been investigated.

6 Data collection information

The data presented in this paper are from recordings made in May 1996 of one male 56-year-old Wa speaker from Anshuai village, Cangyuan county, Yunnan, near the Burmese border. The speech of this village is recognised, understood and spoken as standard by many speakers of other forms of Wa throughout the wider Wa-speaking area. The informant was presented with a list of sentences in the Wa writing system used in China. This script, unlike other muddled Wa scripts in use, is phonologically accurate. In this system, phonation type and final glottal consonants /ʔ/ and /h/ are all indicated consistently. The informant is highly competent in this writing system, having published a number of books and articles in it and being involved in the development of Wa language teaching materials which are used in Cangyuan county and in Wa speaking communities further afield in Burma and Thailand. He was happy to read syllables in this script regardless of whether they occurred as words in the Wa language or not. However, it must be stressed that any conclusions about Wa phonetics drawn in this article are inferred from the speech of this single speaker.

The word list prepared contained all eighteen of the syllables mentioned in section 4 above, placed in the frame sentence (1):

(1)   ʔeʔ   ʔah lɔk   ...   nan   (Wa)
       we   call like   ...   that way.
       'We say ... like that.'

Simultaneous digital audio and laryngograph recordings were made onto stereo digital audio tape in a quiet office in Cangyuan. The informant read the list twice at a similar tempo during a single recording session, which thus yielded a set of 36 tokens. The following equipment was used: Sony TCD-D7 Digital Audio Tape-corder, Sony ECM-717 Electret Condenser Microphone, Laryngograph Ltd Field-model Fourcin-type laryngograph. The recordings were analysed using the PCLx Laryngograph Analyser (version 2.00) software package.

213

The Fourcin laryngograph (Abberton et al. 1989) is a simple and portable device which allows non-intrusive investigation of movement within the larynx. Two electrodes are placed externally on the neck on either side of the thyroid cartilage as near as possible to the position of the vocal folds within. The resistance to the current passed between the electrodes changes as the vocal folds and other parts within the larynx vibrate or move. The changing resistance to the current which passes between the electrodes may be plotted graphically - the resulting image is known as the *laryngograph waveform*[3] or *Lx*. The resistance to the current decreases as the surface area contact between the vocal folds increases, in a relationship which has been shown to be inversely proportional by studies such as the gruesome experiment carried out by Scherer et al. (1988, and references), which tell us that the amplitude of the laryngograph waveform is very closely correlated to the area of vocal fold contact.

The laryngograph waveform gives a clear indication of the periodicity or aperiodicity of vocal fold vibration. If the waveform is periodic, one period T of the waveform is inversely proportional to the frequency f of the vocal fold vibration it depicts. This relationship enables the fundamental frequency F_0 to be calculated more easily and reliably than from a speech pressure waveform, as illustrated in Figure 3.
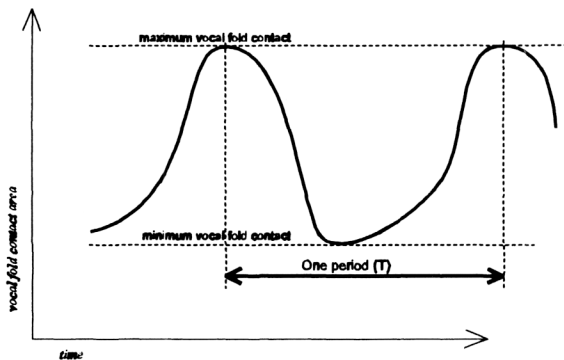

Figure 3 Laryngograph waveform showing period of vocal fold vibration (T). The frequency f of the vibration is calculated as $f = (1/T)$.

The information about phonation type, which is the concern of this paper, is encrypted in the shape of the laryngograph waveform. A visual impression of how the waveform shape can vary is given by the four laryngograph waveforms of this Wa speaker's voice, shown in Figures 4 and 5.
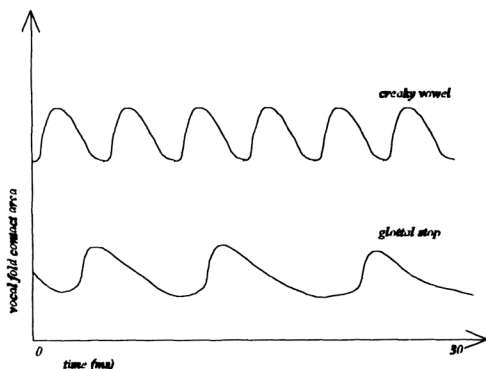
214

Figure 4 Laryngograph waveform shapes of 'creaky' phonation type and glottal stop (realised phonetically as [a̰]) from the Wa syllable /pa̰ʔ/.
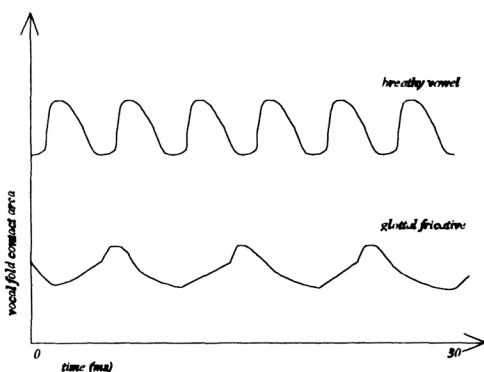

Figure 5 Laryngograph waveform shapes of breathy voice and glottal fricative from the Wa syllable /pa̤h/

8 Closed quotient (CQ)

8.1 Calculating laryngographically derived closed quotient

Closed quotient is one measurement which has been used in the fields of speech pathology (Abberton et al. 1989) and other vocal research (Howard 1995), but seldom in a linguistic context (see, however, Lindsey et al.1992). Closed quotient is defined as the percentage of the waveform period T for which the glottis is closed. This raises the further question of how to define when the glottis is closed, and when open. One of the mathematically most simple and most common is to divide the overall amplitude of the Lx waveform in a fixed ratio[4]. The method outlined here is the method which the Laryngograph Analyser software package uses, in which the ratio is 7:3. So the upper 70% of overall peak-to-trough

215

amplitude is defined as the closed phase and the lower 30% is the open phase. This ratio, like the parameters involved in any of the methods for measuring CQ, is arbitrary, but has been found convenient and reliable in previous studies using the Fourcin laryngograph (Davies et al. 1986). The closed phase CQ is calculated as a percentage of the waveform period. Figure 6 illustrates the what this calculation means in terms of laryngograph waveform shape:
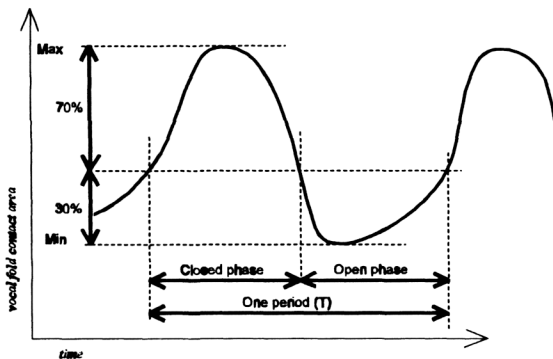

Figure 6 Illustration of closed quotient measurement. Closed quotient (CQ) is calculated as CQ = closed phase / T.

In two-dimensional graphic terms, the closed quotient is a measure of the relative pointedness and/or breadth of the waveform peak and troughs. The closed phase, and therefore also the closed quotient, is greater when the peaks are broader relative to the troughs; it is less when the troughs are broader or fuller relative to the peaks. We can expect the Lx waveforms of speaker's creaky and breathy vowels (in the upper halves of Figures 4 and 5 above) to display a difference in CQ even from a hasty visual comparison of the two shapes. Looking at the shapes of the Lx waveforms of his glottal stop and glottal fricative (in the lower halves of Figures 4 and 5 above), it is easy to see why both of them yield similar closed quotient measurements, since both are relatively far more broad-troughed.

Abberton et al. (1989) and Howard (1995) examine what the CQ measurement can tell us about the phonation represented by the laryngograph waveforms from which it is derived. Assessing the relationship between what can be measured on paper (or by a computer) and the physiological reality of movement in the larynx is beyond the scope of the present paper.

8.2 Measurements of closed quotient in Wa

The recordings were stored onto the lab computer's hard disk and the Laryngograph software was used to calculate closed quotient from the laryngograph traces at two points in each of the 36 tokens, the first half-way through the vowel and the second at syllable end, defined as the last cycle of vocal fold vibration for which the computer could derive F_0 and CQ form the laryngograph trace. Figures relevant

216

to observations made below are in bold type. The closed quotient measurements from all 36 syllables (see Table 1) included in this study are summarised below in Table 2. Fundamental frequency measurements from the same syllables are set out in Table 3 for comparison.

Table 2: Closed quotient

	mid-vowel		change to syllable-end		
	creaky[5]	breathy	creaky	breathy	**both registers**
open syllable	56.28 (3.30)	48.33 (6.55)	-1.25 (1.89)	+4.23 (3.96)	**+0.58 (3.72)**
/ʔ/ final	58.65 (1.48)	57.72 (2.54)	-20.02 (8.36)	-18.35 (5.84)	**-19.47 (7.38)**
/h/ final	59.04 (2.09)	51.2 (3.91)	-24.91 (3.92)	-18.25 (4.86)	**-22.69 (5.19)**
all finals	**57.99 (2.62)**	**52.42 (5.87)**			

Table 3: Fundamental frequency

	mid-vowel		change to syllable-end		
	creaky	breathy	creaky	breathy	**both registers**
open syllable	182.91 (11.92)	165.15 (6.94)	-6.43 (5.79)	-3.20 (3.88)	**-5.35 (5.29)**
/ʔ/ final	187.16 (8.07)	176.05 (12.37)	-95.53 (17.79)	-92.88 (20.23)	**-94.64 (17.74)**
/h/ final	198.19 (7.00)	182.25 (4.44)	-72.64 (17.25)	-62.15 (9.79)	**-69.14 (15.5)**
all finals	**189.42 (11.01)**	**174.48 (10.71)**			

Tables 2 and 3 Mean (with s.d. in parentheses) measurements of closed quotient (CQ in %) and fundamental frequency (F_0 in Hz) made at a point half-way through the vowel are shown on the left of the table, categorised by vowel phonation type.

217

The right-hand part of the table shows the difference between measurements of CQ and F_0 at mid-vowel and syllable end, this time categorised by syllable final consonant (or lack of).

Two observations were made from the closed quotient measurements. Firstly, as might have been expected from applying the closed quotient calculation illustrated in Figure 6 to the laryngograph waveform shape of a creaky vowel shown in Figure 4, closed quotient is significantly (p=.008) greater in creaky Wa vowels than in breathy, irrespective of syllable final. In Figure 7, closed quotient can be seen to be increasing through the open breathy vowel. A greater difference in closed quotient would have been recorded had the comparison been made nearer the beginning of the vowel rather than at the mid-point. This pattern was observed only for open breathy vowels and not for those with laryngeal consonant finals.
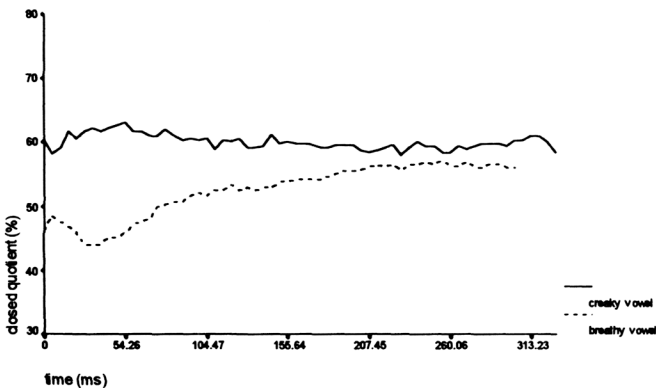

Figure 7 Comparison of closed quotient in Wa vowel /a/ with creaky and breathy phonation types. Taken from syllables /pạ/ and /pạ/

The second observation is more surprising. Given the similarity between Wa creaky phonation and glottal stops and between breathy phonation and glottal fricatives demonstrated in the laryngograph waveforms in Figures 4 and 5, it might have been predicted that the closed quotient of glottal stops and glottal fricatives might diverge yet further than do the mean closed quotient measurements of creaky and breathy vowels. In fact, the reverse is true: syllable final glottal stop /ʔ/ and glottal fricative /h/ are both characterised by a fall of around 20% in closed quotient, the slight difference between the mean fall being statistically insignificant. The similarity is illustrated in Figure 8.
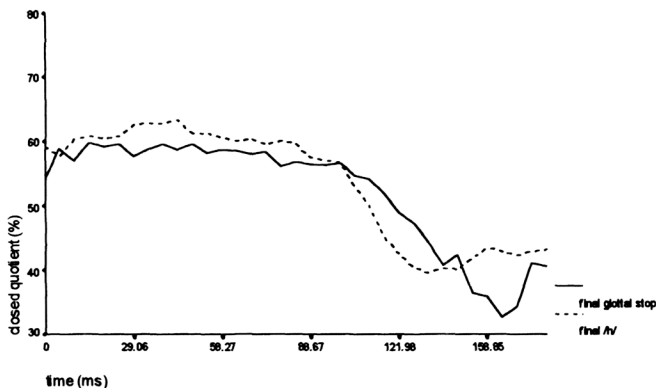
218

Figure 8 Comparison of closed quotient in Wa glottal stop and glottal fricative, following creaky /a̰/ vowel. Taken from syllables /pa̰ʔ/ and /pa̰h/.

9 Skewness

9.1 Calculating Skewness

The new measurement involves assessing the symmetry of the laryngograph waveform by expressing the peak-to-trough time as a proportion of the waveform period. Note that this does not involve the use of any model-dependent set ratio or other parameter. The derivation of the skewness measurement from a hypothetical laryngograph waveform is illustrated in Figure 10.
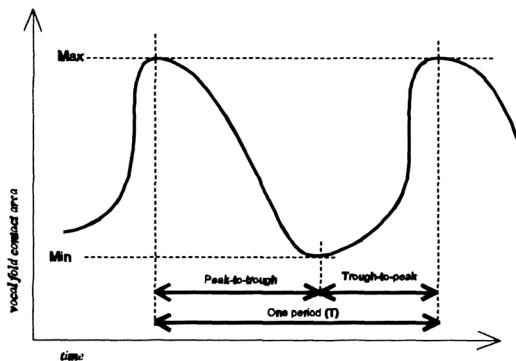
Figure 9 Illustration of skewness measurement. Leftward skewness is calculated as (peak-to-trough / one period) × 100%.

It is important to note that reference here is made not to open and closed phases but to the skewness of the wave as a whole, the simplest way of measuring which is by comparing the portions of the waveform period for which vocal fold area contact is decreasing from the maximum to the minimum (peak-to-trough) and

219

increasing from the minimum to the maximum (trough-to-peak) respectively. No reference is made to the rate of amplitude change at difference stages of the waveform cycle other than pinpointing the peak and the trough, nor is it claimed that the peak or the trough correspond to significant points or phases during the cycle of vocal fold vibration.

Skewness is a measure of the waveform's degree of symmetry. Leftward skewness is measured here as the peak to trough time as a percentage of the waveform period. For a symmetrical waveform, when the closing and opening phases are equal, the skewness as measured here is 50%. Leftward rather than rightward skewness is chosen so that the creakier the phonation, the higher the numbers returned by the skewness measurement technique used here. The choice of leftward skewness over rightward is a matter of convenience only. What is significant is how skewness can help us describe the laryngograph data.

Attempts have been made to interpret the symmetry of the laryngograph waveform and the glottal pulse it represents. (Ní Chasaide and Gobl 1997:440, Titze 1990:7). Laryngograph waveforms are typically skewed to the left to some degree, though the skewness can be relatively more leftward or rightward. A more symmetrical glottal pulse, which boosts the lower harmonics, is a hallmark of breathy phonation (Ní Chasaide and Gobl 1997:440) and is observable in the spectra (Figs 1 and 2) and laryngograph waveforms (Figs 4 and 5) derived from these Wa recordings. Conversely, creakier phonation is associated with an Lx waveform shape skewed to the left.

Care has to be taken in interpreting the skewing of the laryngograph waveform, since skewing is indicative both of qualitative differences in phonation type and of the intensity of laryngeal excitation. (Ní Chasaide and Gobl 1997:441). However, for the purposes of this descriptive study, confusion or failure to distinguish between these two causes of skewness is likely to enhance, rather than blur the results, since creaky voice generally involves a sharper laryngeal pulse than breathy (Ladefoged 1988:301).

By comparing the waveforms in Figures 4 and 5 in this light, skewness emerges as an obvious way of quantifying the difference between the laryngograph waveform shapes of glottal stops and fricatives.

9.2 Measurements of Skewness in Wa

Leftward skewness was calculated at the same points in each of the syllables as closed quotient was in the section above. The figures are set out in Table 4 below.

220

Table 4: Leftward Skewness

	mid-vowel		change to syllable-end		
	creaky	breathy	creaky	breathy	**both registers**
open syllable	65.27 (4.42)	58.6 (4.65)	+0.56 (4.57)	+3.57 (2.31)	**+1.49 (4.13)**
/ʔ/ final	66.06 (4.87)	59.33 (0.77)	+3.48 (7.53)	+12.54 (0.66)	**+6.50 (7.49)**
/h/ final	65.56 (4.98)	63.78 (1.56)	-12.97 (3.57)	-13.12 (1.13)	**-13.02 (2.91)**
all finals	**65.63 (4.56)**	**60.57 (3.53)**			

Table 4 Mean (with s.d. in parentheses) measurements of the Leftward Skewness (in %) made at a point half-way through the vowel are shown in the left-hand part of the table. The right-hand part of the table shows the change by the end of the syllable.

Notice that, like the closed quotient measurement, the mean leftward skewness is 65.63% at the midpoint of creaky vowels and 60.57% in breathy vowels: the two are significantly (p=0.01) different by 5.06%, though the percentage difference is not of the order of the 15.04% difference observed between the closed quotients of creaky and breathy vowels recorded in Table 2. Miraculously, though, the mean change in leftward skewness between mid-syllable and syllable end is different for each type of syllable final included in the study. Leftward skewness increases slightly, but not significantly, in open syllables. A barely significant (p=0.55) mean rise is observed during a glottal stop /ʔ/ if the phonation type of the preceding vowel is not taken into account. The mean rise of 12.54% is rise is highly significant (p=0.003) for glottal stops following breathy vowels only. Leftward skewness is dramatically (p=0.000) less, by an average of 13.02% during the articulation of a glottal fricative syllable final /h/.

In terms of the Wa phonation type continuum proposed in Section 5 above, a high degree of leftward skewness denotes a position towards the creaky end; less leftward skewness indicates a position nearer the breathy end.

10 Implications and directions for further research

Closed quotient is sensitive to the differences in shape between the upper and lower regions of the plane on which the laryngograph waveform is plotted, while

221

skewness takes into account symmetry in the left-to-right dimension of the same plane. In these Wa measurements there is a trade-off between the enhanced differentiation of creaky and breathy voice possible with closed quotient and the focus of the skewness measurement on the difference between glottal stop and glottal fricative. The two measurements offer complementary perspectives of the laryngograph waveform. The work that has been done relating closed quotient to the physiological activity within the larynx makes it an attractive tool. The practical usefulness of the skewness measurement for these Wa data is intriguing, however. Speculating momentarily, it seems likely that a measurement of laryngograph waveform skewness should be linked to the relative speed with which the vocal folds open and close during phonation, and perhaps also about the muscular activity and aerodynamic conditions in the glottis which would occasion such a difference. Closed quotient is based on the premise that the folds close more quickly than they open and defines instead open and closed phases, even though the vocal folds are in constant motion during phonation and the line dividing these phases has to be imposed artificially.

If the phonation type continuum model is tenable and there is a reliable experimental procedure which can assign speech sounds a position on it, then it should be possible to make some statement about the precise articulatory events within the larynx when sounds with conflicting phonation type characteristics come into contact with one another. This in turn might lead to new insights into the coarticulation of phonation types and laryngeal sounds.

Measuring skewness of the laryngograph waveform has proved undeniably useful for describing these Wa data. It remains to be applied to phonation type phenomena in other languages.

Notes

1. Partial support for this research was provided by grants from the Scholarships Committee of the School of Oriental and African Studies and the Humanities Research Board of the British Academy.

2. There is a connection between vowel quality (in terms of formant frequencies) and registral phonation type in Wa (Wang and Chen 1981:50), as in many Mon-Khmer languages. This, and a suspected relationship between phonation type and spectral profile at higher frequencies, are the topics of work in progress.

3. In some studies, typically those which call the device an electroglottograph (EGG), the resistance to the current instead of the current itself is plotted. The resulting waveform is vertically flipped but otherwise identical to the waveforms shown in this paper.

4. A number of other methods of measuring the *open* and *closed phases* of the waveform are described in Howard 1995:164.

5. The registral phonation type contrast is neutralised in vowels following aspirated initials. These vowels have creaky phonation type.

References

Abberton, E.R.M., David Howard and Adrian Fourcin. 1989. Laryngographic assessment of normal voice: a tutorial. Clinical Linguistics and Phonetics 3.281-296.
Catford, John. 1964. Phonation types: the classification of some laryngeal components of speech production. In Honour of Daniel Jones, ed. by David Abercrombie et al., 26-37. London: Longmans.
Davies, P., Geoffrey Lindsey, H. Fuller and Adrian Fourcin. 1986. Variation in glottal open and closed phase for speakers of English. Proceedings of the Institute of Acoustics 8:539-546.
Diffloth, Gérard. 1980. The Wa languages. Linguistics of the Tibeto-Burman Area 5.2
Gregerson, Kenneth J. 1973. Tongue-root and register in Mon-Khmer. Paper presented at the First International Conference on Austroasiatic Linguistics, Honolulu, January 1973. Published 1976 in Austroasiatic Studies Part 1, Oceanic Linguistics Special Publication No.13, ed. by Philip Jenner et al., 323-369. Honolulu: University of Hawaii Press.
Henderson, Eugénie J.A. 1952. The main features of Cambodian pronunciation. Bulletin of the School of Oriental and African Studies 14.149-174.
Howard, David. 1995. Variation of electrolaryngographically derived closed quotient for trained and untrained adult female singers. Journal of Voice 9.2.163-172.
Ladefoged, Peter, Ian Maddieson and Michel Jackson. 1988. Investigating phonation types in different languages. Vocal Physiology: Voice Production, Mechanisms and Functions, ed. by Osamu Fujimura, 297-317. New York: Raven Press.
Laver, John. 1980. The Phonetic Description of Voice Quality. Cambridge: Cambridge University Press.
Lindsey, Geoff, Katrina Hayward and Andrew Haruna. 1992. Hausa glottalic consonants: a laryngographic study. Bulletin of the School of Oriental and African Studies 60.3:511-527.

Maddieson, Ian and Peter Ladefoged. 1985. Tense and Lax in Four Minority Languages of China. UCLA Working Papers in Phonetics 60.59-83.

Matisoff, James A. 1973. Tonogenesis in Southeast Asia. Consonant Types and Tone, ed. by Larry Hyman, 71-95. Los Angeles: University of Southern California Department of Linguistics.

Ní Chasaide, Ailbhe and Christopher Gobl. 1997. Voice source variation. Handbook of Phonetic Sciences, ed. by William J. Hardcastle and John Laver, 427-461. Oxford: Blackwell.

Scherer, Ronald C., David G. Druker and Ingo R. Titze. 1988. Electroglottography and direct measurement of vocal fold contact area. Vocal Physiology: Voice Production, Mechanisms and Functions, ed. by Osamu Fujimura, 279-295. New York: Raven Press.

Svantesson, Jan-Olof. 1983. Kammu Phonology and Morphology. Travaux de l'Institut de Linguistique de Lund 18. Lund: Gleerup.

_____. 1993. Phonetic correlates of register in Paraok. Reports from Uppsala University Linguistics 23.102-105.

Theraphan L-Thongkum. 1987. Another look at the register distinction in Mon. UCLA Working Papers in Phonetics 67.132-165.

_____. 1988. Phonation types in Mon-Khmer languages. Vocal Physiology: Voice Production, Mechanisms and Functions, ed. by Osamu Fujimura, 319-331. New York: Raven Press.

_____. 1990. The interaction between pitch and phonation type in Mon: phonetic implications for a theory of tonogenesis. Mon-Khmer Studies 16-17.11-24.

Titze, Ingo R. 1990. Interpretation of the electroglottographic signal. Journal of Voice 4.1:1-9.

Wang Jingliu and Chen Xiangmu. 1981. Wayu Anshuai hua de yinwei xitong [The sound system of Anshuai Wa]. Minzu xuebao 1981. Also in Wang (ed.) 1994.39-57)

Wang Jingliu, Zhang Huapeng and Xiao Yufen (eds) 1994. Nbēen Loux Vax / Wayu yanjiu [Research on the Wa language]. Kunming: Yunnan Minzu Chubanshe

Zhou Zhizhi and Yan Qixiang. 1983. Bulang yu gaikuang [A survey of the Blang language]. Minzu yuwen 2.71-81.

_____. 1984. Wayu Jianzhi. [An Introduction to Wa]. Beijing: Minzu chubanshe.

BURMESE ENGLISH ACCENT

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I. INTRODUCTION

As knowledge of the English language has become increasingly important in non-English speaking countries, many non-native varieties of English have developed due to the contact of English under various circumstances. In the case of Burma, during the British rule of the country from 1885 to 1947 English was used in the areas of government, law, and education (Han-Tin, 1990). Since Burma's independence, however, the Burmese language has been reintroduced in these areas and the use of English has diminished. The contact between the two languages has left Burma with Burmese English, which includes an accent as one of its characteristics. Little or no study has yet been done on English spoken by the Burmese. In response to the lack of research on Burmese English, this study will explore the characteristics of the Burmese English accent. The segmental and suprasegmental traits of Burmese spoken English will be described using the method suggested by Mohanan (1992) where a non-native variety of English is viewed as having a system of its own. This paper sets out to identify the phonological characteristics of Burmese English with the aim that this knowledge will assist in the comprehension of the English spoken by Burmese speakers.

Studies on non-native varieties of English such as the English spoken by the speakers of Japanese (Suenobu et al., 1992; Basson, 1988; Beckman and Pierrehumbert, 1986; Sheldon and Strange, 1982; Dickerson, 1975), Hebrew (Basson, 1988), Arabic (Munro, 1993; Eltrug, 1984; Flege and Port, 1981; Zughdul, 1979), Brazilian (Major, 1986), Dutch (Koster and Koet, 1993), Chinese (Juffs, 1990), Russian (Thompson, 1991), French (Flege and Davidian, 1984), and Hungarian (Nemser, 1971) among others enable speakers in the community of "World Englishes" to communicate with minimum misunderstanding. With the intention to familiarize other English speakers with the Burmese English accent, this paper will describe the characteristics of a strong Burmese English accent.

II. METHOD

1) Subjects

Fifteen English major students and three English instructors from Rangoon University volunteered to be the subjects for this study. All of them were Burman males who grew up speaking only Burmese and no other languages at home. A questionnaire was given to the subjects regarding

their age, level of education, total years of study of English, age at which English language learning began, and career goals.

The age of the students ranges from twenty three to thirty one. Except for one student who started at age four, the rest of the subjects started to learn English at ten years of age. In general, the instructors had studied the language three to five years longer than the students. All of the instructors had a bachelor of arts degree in English while three students were studying in the third year English major and the rest were in the fourth year. Most of the students' career goals were related to fields where the use of English language is required except for two who intended to work in fields which do not require the use of English.

2) Material

For the present study, word lists, isolated sentences, and a paragraph are selected for the data. 445 words[1] and a passage of 199 words[2] are chosen to elicit consonants, vowels, diphthongs and consonant clusters from the English phonemic system. These are presented to the subjects first for silent reading in order to familiarize them with the materials, and then for reading aloud for recording.

3) Transcription

The transcription is repeatedly checked by the author as well as by two graduate students who have taken linguistics courses including phonetics and phonology to ensure the maximum detail and accuracy.

4) Accentedness rating and grouping

Excerpts with the length of 40 to 55 seconds are taken from the reading passage. They are broken at natural pauses and are approximately 3 to 4 sentences long. Four isolated words read by each speaker precede each excerpt from the reading passage in order to familiarize the listeners with the speaker's voice. A group of eight students from Northern Illinois University (NIU) listen to the excerpts and rate the accent on the scale of one to five. The mean for each speaker is calculated and three groups are established from the ratings.

In the first group, the ratings range from a mean of 1.375 to 1.875, establishing the least accented group. In the second group, the means range from 2.75 to 3.625. The means of the most highly accented group range from 4.125 to 4.375. The present study focuses only on the speakers in the most accented group consisting of four students.

226

III. DESCRIPTION OF A STRONG BURMESE ENGLISH ACCENT

1) Phonemic inventory of segmentals

Consonants. The following twenty-six phonemes are found in the strong Burmese accent:

	bilabial	labio-dental	dental	alveolar	palato-alveolar	palatal	velar	glo
nasal	m			n			ŋ	
stop	p b			t d			k g	
fricative		f v	θ ð	s z	ʃ ʒ			h
affricate					tɕ, ʧ, ʤ			
liquid				l, r				
glide	w̥ w					j		

Vowels. All of the speakers use the following ten vowels:

	Close	Half-close	Half-open	Open
Front	i, ɪ		ɛ	
Central		ə	ʌ	
Back	u, ʊ	o	ɔ	ɑ

Diphthongs. The diphthongs are as follows:

/uə/ (or /uɑ/) as in "poor,"

/iə/ (or /iɑ/) as in "peer,"

/aɪ/ as in "my,"

/aʊ/ as in "now,"

/ɛə/ as in "there,"

/eɪ/ as in "name," and

/oʊ/ as in "boat."

2) Distribution of the phonemes

Consonants. (a) The following consonants occur in the syllable-initial as well as final position:

stops: /p/, /t/, /k/, /b/, /d/, /g/
fricatives: /f/,/v/,/θ/, /s/, /ʃ/
affricates: /tʃ/, /dʒ/
nasals: /m/, /n/
liquid: /l/

(b) The speakers use the following consonants in syllable-initial position:

fricatives: /ð/, /z/, /ʒ/, /h/, /w̥/
glides: /w/, /j/
affricate: /tɕ/
liquid: /r/

(c) The nasal cosonant /ŋ/ occurs only in the syllable-final position.

Vowels. All the vowels can occur as an onset as well as a nucleus.

Diphthongs. The diphthongs /aɪ/, /aʊ/, /ei/, and /oʊ/ occur as onsets as well as nuclei, or as a rime, as in "eye," "out," ate," "own," and "mine," "now," "make," and "poke." The diphthongs /uə/ or /uɑ/ (as in "poor"), /ɛə/ or /ɛɑ/ (as in "there"), and /iə/ or /iɑ/ (as in "mere"), on the other hand, occur only in a rime.

3) Consonant clusters

Syllable Initial Clusters.
  • *Two Consonants.* The following double consonants occur in the syllable-initial position:

		Examples
voiceless fricative + nasal	/sn/, /sm/	snow, smoke
voiceless fricative + liquid	/sl/, /fl/, /fr/	slow, flower, afraid
voiceless fricative + glide	/sw/	swim, sweet
voiceless fricative + stop	/sp/, /st/, /sk/	speak, steel, school
voiceless stop + liquid	/pr/, /tʰr/, /kʰr/, /pl/, /kl/	prefer, trace, crocodile, pleasure, clasp
voiceless stop + glide	/tw/, /kw/	twelfth, quartz
voiced stop + liquid	/br/, /dr/, /gr/	bread, draft, grasp
voiced stop + glide	/gj/	argue

  • *Three Consonants.* In the syllable-initial position, there is only a series of a fricative, a voiceless stop, and a liquid, the three of which occur as a cluster: /spl/ (as in "splendid"), /spr/ (as in "sprout"), /str/ (as in "stream"), and /skr/ (as in "screw"). Every subject inserts a schwa between /s/ and the voiceless stop at least twice out of eight possible occurrences. In addition, speaker number one (S1) simplifies the cluster by deleting /s/ in "screw" and "scream." Both S1 and speaker number 4 (S4) delete /r/ in "street."

• *Two Consonants.* The following double consonants are found in the syllable-final position:

		Examples
voiceless stop + fricative	/ts/	cats, mathematics
liquid + fricative	/ls/	holes, battles, puzzles
nasal + fricative	/ns/, /nθ/	avoidance, problems, things, month
nasal + voiceless stop	/nt/, /nʔ/	excellent, statement
nasal + voiced stop	/mb/	limbs

• *Three Consonants.* The majority of the final clusters have two consonants, and one series of three consonants occurs as a syllable-final cluster; that is, a nasal, a voiceless stop, and a fricative all following one another as in "glimpsed." Words such as "flasks," "sculps," "taxed," have one or two consonants, but not three, at the end of the syllable.

4) Alternations

Stops. As in many non-native varieties of English such as Afro-American languages and dialects, Sranan, Jamaican, Kenya Pidgin Swahili and Fanagalo (Allyne, 1980; Heine, 1979), voiceless unaspirated stops are used in the syllable initial position as well as after [s]. On the other hand, [tʰ] and [kʰ] occur before [r], while /p/ still occurs unaspirated. In the syllable final position, the stops are either released or non-released.

Sometimes the final [p] alternates with [b]. S1 and speaker number 3 (S3) pronounce "rub" as [rʌb], but speaker number 2 (S2) and S4 pronounce it as [rʌp']. When the word is followed by the suffix [er], however, the root has a final [b]. Similarly, the final [t] occasionally alternates with [d]. S3 and S4 have [t'] at the end of "understand," but it turns into [d] in "understanding." Occasionally, the syllable-final stops alternate with [ʔ].

Liquid /r/. Following a vowel, /r/ is not realized. When a root ending with /r/ is followed by suffixes such as "-er," "-y," "-al," "-ation," or "-atory," however, it is pronounced. For example, even though the /r/ following the vowel in the second syllable of "prepare" is not realized; it is pronounced in "preparatory."

Vowels.   When followed by /r/, the schwa turns into [A]. Therefore, "sicker" is pronounced as [sɪkɑ]:

/sɪkər/   phonemic

sɪkɑr   schwa alternation

sɪkɑ   [r] deletion

[sɪkɑ]   phonetic

When followed by /l/, the schwa sometimes alternates with [ɛ]. In "political" and "several," the final syllables have [ɛ], but S1 and S2 say "individual" with [ɛ] while S3 and S4 have [ə].

The vowels [o] and the diphthongs [ou] are in complementary distribution. While [o] occurs before [l], [s] , and in open syllables, such as in "pole," "pose" and "go," [ou] occurs before stops and nasals, as in "bode," "poke," "boat," "cope," "telephone," and "won't."

Similarly, while [e] occurs in an open syllable, as in "stay," "play," "paper" and "lady,"   before /l/, as in "hail," and before the fricatives /f, v, s/, as in "behave," "caves," "trace," the diphthong [ei] occurs before voiceless stops, as in "tape," "portrait," "takes," and before nasals, as in "game," "against," "danger" and "training."   [ei] also occurs before the fricative /θ/, as in "eighth." [3]

The alternation of [e] with [ei], however, does not occur across morpheme boundaries. For example, even though [ei] precedes [d] in "bayed," the word is pronounced with [e] since [d] is not part of the root but a past-tense morpheme added to "bay." On the other hand, "afraid" is pronounced with [ei] because here [d] is part of the root.

5) Realization of the plural and singular present-tense morphemes

Following voiced and voiceless non-sibilant consonants as well as vowels in words such as "peas," "machines," "battles," "legs," "heads," "cats," "clasps," "flasks," "months," and "films," [s] is used for the plural morpheme. In words such as "exercises" and "braces," most speakers have nothing for the plural morpheme. Some speakers, however, have [ɪs] as in "roses."

The speakers normally do not realize the singular present-tense morpheme. If they do, [s] is used after voiced or voiceless non-sibilants. Following sibilants, however, it is realized either as [ɪs] or [əs], as in "touches" and "fishes," respectively.

230

6) Realization of the past-tense morpheme

Following all voiced and voiceless phonemes except alveolar stops, the speakers use [t] most of the time except after alveolar stops. Occasionally, the speakers use [d] following voiced stops, as in "interviewed," or nothing, as in "asked." Following alveolar stops, however, the past-tense morpheme is realized as [ɪd] or [ɪt], as in "interested."

7) Realization of form words

There are two different forms of the article "the": [ðə] and [ðɛ]. These forms are used interchangeably in front of words that begin with a vowel or a consonant.

For the article "an" and the conjunction "and," [ɛn] is used. Moreover, the speakers use the full form of the prepositions "at," "of," "to," and "for" as well as the auxiliaries "have," "can," and the article "a."

8) Suprasegmentals

Words with Different Suffixes. Most polysyllabic words in the data receive equal stress on every syllable, as would be the case for syllables in the Burmese language. Nevertheless, in words ending with '-ise' or '-ize' (as in "apologize," "advertise," or "televise"), the speakers tend to place stress on the last syllable.

In words ending with "-ation," (as in "explanation," "application," "qualifications," "relation," and "organization"), the stress falls on the penultimate and the final syllables for most of the speakers. Similarly, words such as "discussion, progression" and "television" tend to receive stress on the last two syllables. When words with "-ation," such as "corporation" and "nation," occur as loan words in Burmese, the last two syllables have a high tone, and Burmese speakers in the study seem to carry this process into English.

The tendency to stress the last two syllables is also found in words ending with "-ic," such as "democratic," and "photographic." In general the speakers stress all the syllables in the words ending with "-y" such as in "democracy" and "photography." For the roots "democrat" and "photograph," every speaker stresses the last syllable.

Compound Words. In compound words such as "woodpecker," "upstairs," "take-over," "landlady," "Snow White," "bloodshed," "tape-recorder," "post-graduate," "waste-paper basket" and "carpet-sweeper," the first word receives the primary stress.

Sentence Stress. According to Gimson (1989), a native English speaker stresses the parts of an utterance to which he wants to attach

particular meaning and pronounces the remaining words or syllables weakly and rapidly. Moreover, he found that an utterance which has more content words is likely to receive more stresses than one that has the same number of syllables but more form words (p. 263).

In the present study, however, all the respondants pronounce the unstressed and the stressed syllables with equal length. Furthermore, since most polysyllabic words tend to receive equal stress on every syllable, the speakers have a *syllable-timed rhythm which is different from that of* AE and BrE speakers but similar to "machine gun rhythm" found in Singaporean English (Tay, 1982, p. 135).

In the following sentences, the speakers tend not to stress articles, the modal auxiliary "can," and pronouns, but the remaining words are stressed equally:

1. Do ·'not ·'speak to me.
2. Do you ·'have a ·'match?
3. Can you ·'play the ·'piano?
4. ·'Have you ·'done ·'any ·'work this ·'week?
5. ·'There ·'is a ·'conflict ·'in her ·'schedule.

9) Intonation

Most speakers display a falling intonation for statements, imperatives and requests, Yes-No questions, as well as the tag questions. For one Wh-question, the speakers differ from one another in their intonation patterns: while S2 has a falling intonation, S1 has a rising intonation; S3 displays no intonation contour, and S4 has a rising-falling intonation.

10) Summary

Segmentals in Strong Burmese English Accent.
              • *Consonants.* The following features in the accent are observed:

(a) There are 26 consonants in the phonemic inventory.
(b) A positional constraint specifies that the voiceless unaspirated stops [p, t, k] appear following /s/ as well as in the syllable-initial position, except before /r/, where /t/ and /k/ are aspirated and /p/ still occurs unaspirated. Thus, in the allophonic system of voiceless stops, there is a gap for [p^h].
(c) A positional constraint prevents /r/ from appearing after a vowel except when followed by suffixes.
(d) Most of the consonant clusters tend to be restricted to double consonants either in the syllable initial or syllable final position. If there are more than

232

two consonants in a cluster, the speakers tend to simplify it either by the insertion of a vowel or by deletion.

- *Vowels.* The following features in the accent are observed:

(a) There are ten vowels and seven diphthongs in the phonemic inventory.
(b) A positional constraint prevents [ə] from occurring before /r/. In this position, [ɑ] is found instead.
(c) [o] and [oʊ] are in complementary distribution. While [o] occurs in open syllables and before /l/ and /s/, [oʊ] occurs before stops and nasals.
(d) [e] and [ei] are in complementary distribution. While [e] occurs in open syllables, before /l/, and before the fricatives /f, v, s/, [ei] occurs before voiceless stops and nasals.
(e) [ɛ] and [ə] are in free variation before /l/.
(f) Unstressed syllables and most of the form words, such as prepositions, are given full vowel values.

Suprasegmentals in Strong Burmese English Accent

- *Stress and intonation.* The following features in the accent are observed:

(a) Most polysyllabic words tend to receive equal stress on every syllable.
(b) If there is an unstressed syllable, it will be given an equal length as the stressed syllable.
(c) In sentences, every word tends to receive an equal degree of stress.
(d) The speakers have syllable-timed rhythm.
(e) Words such as "democrat" and "photograph" and those with suffixes such as "-ise" and "-ize" which receive stress on the antepenultimate syllable in American English (AE) and British English (BrE) tend to receive stress on the final syllable.
(f) Words with suffixes such as "-ation" and "-ic" tend to receive equal stress on the penultimate and final syllables.
(g) The speakers tend to use falling intonation for all types of sentences including Yes-No questions.
(h) The speakers do not rely on stress or intonation to convey meaning; therefore, contrastive stress is lacking.

IV. COMPARISON OF A STRONG BURMESE ENGLISH ACCENT WITH BRE AND AE ACCENTS

1) Words with similar pronunciation to BrE

Many words have similar pronunciation to BrE rather than AE. For example, "interested" has three syllables and "history" two syllables as

in BrE, whereas AE has four and three syllables, respectively. Furthermore, "but" and "such" are pronounced with /ʌ/, as they are in BrE, rather than with /ə/ as in AE. The first syllable in "either" is /aɪ/ rather than /i/, and "ask" is said with /ɑ/ rather than with /æ/, as are "classify," "basket," "photograph," "last," "fantastically," and "advance." The first consonant in "schedule" is /ʃ/ rather than /sk/. "Vitamin" is said with /ɪ/ in the first syllable instead of /aɪ/ as in AE. Like BrE speakers, Burmese speakers do not realize /r/ after a vowel in a syllable-final position except when followed by a suffix. On the other hand, while "where" and "there" are said with [ɛə] in BrE, Burmese speakers have either [ɛ:] or [ɛə].

Even though "boat" and "telephone" are pronounced with [əʊ] in BrE, Burmese speakers have [ou]. Furthermore, while in BrE "which" and "whether" are pronounced with [w], Burmese speakers use [w̥] like some American speakers (Roach, 1991, p.51).

In AE, sometimes /t, d, n/ occur as flaps between vowels as in "latter," "ladder," "tanner" (Ladefoged, 1982, p. 153). Burmese speakers do not demonstrate flaps in these environments. For example, "bitter" and "battles" are pronounced with [t].

2) Differences between BrE and AE and strong Burmese English Accent

Segmentals. Most consonants and vowels in Burmese speakers' English correspond to AE and BrE consonants. On the other hand, [tɕ] exists in the phonemic inventory of Burmese speakers while it is absent in AE and BrE. Furthermore, similar to the English of speakers of other languages, processes such as substitutions, devoicing, deletion, and cluster simplification of the source languages can be detected.

3) Substitutions

Consonants.

	AE & BrE Consonants		Corresponding Consonants	Examples
	Initial	Final		
Stops		/p, t, k/	None, / t', s, ʔ/	cheap, group, cope, look
		/b, d/	None, /s/, /ʔ/	job, riverside, attitude
		/g/	/t/	rig, rug
Nasals		/ŋ/	/n/	going, being
		/n/, /ŋ/	nasalized vowels	incline, song, being
		/v/	/t, ʔ/	five, attractive

Fricatives		/θ/	/t/	hundredth, wreath, bath
		/s/ /z/	None, /t, ?/	mattress, apologize
Affricates		/dʒ/	None, /t/	manage, large
Clusters	/kj/; /tu/ or /tj/		/tɕ/	occupy, opportunity, attitude

Vowels and dipthongs. The vowels /i, ɪ, ɛ, u, ʊ, ʌ, ɔ/ and /ɑ/ in Burmese English correspond to those of AE and BrE. /ə/ in certain contexts, however, differ along with some diphthongs.

AE & BrE Vowels	Corresponding Vowels	Examples
/æ/	/ɛ/	attitude
/ə/	/ɛ/	corporal
/ə/	/ɑ/	perfect
/ə/ or /ɜ/	/ʌ/	first, bird
/ɔɪ/	/waɪ/, /waĩ/	avoid, enjoyable
/aɪ/	/aĩ/	file, classify
/aʊ/	/aũ/	now, how, around
/oʊ/	/o/	so, day

4) Devoicing

Voiced obstruents in syllable-final position in BrE and AE tend to appear voiceless. For example, "heed" is said with a final [t'], "fatigue" with [k'], "heads" with [s], "attractive" with [f], "soothe" with [θ], and "Cambridge" with [tʃ]. This devoicing process, however, is not restricted to Burmese speakers of English but occurs in the speech of most second-language learners (Major, 1987; Altenberg and Vago, 1987).

5) Cluster simplification

While allthe syllable-initial consonant clusters with two consonants in AE and BrE exist, when three consonants appear in the initial position the speakers may have a simpler structure than in AE and BrE. There may be a schwa between the first and second consonants, or either the first or the third consonant in AE and BrE may not be present. For example, in "screw," and "scream," S1 does not have an initial /s/; in "scream," S3 and S4 insert a schwa between /s/ and /k/, and S4 deletes /r/. If the third consonant is /l/, speakers tend to have a schwa between the first two consonants, as in "splendid" and "split."

In the syllable-final position, when there are two consonants in AE and BrE, Burmese speakers may have one less segment. When there are

235

more than two consonants in the AE and BrE clusters, there is one or two fewer segments. For example, for "cats" and "roads," there is only one final consonant. Furthermore, "test, must, dusts," and "rests" may be pronounced only with /s/ as the final consonant.

6) Influence of written words

Many second language learners have been noted to have spelling pronunciation. For example, unstressed syllables are said with full vowel values due to the influence of the written representation of words (Young-Scholten, 1995). Burmese speakers also tend not to reduce vowels in unstressed syllables. For example, form words such as "a," "an," "the" as well as the auxiliary verbs are said with their full vowel values.

In BrE and AE, along with a change of placement of stress for "prefer" and "preference," there is a vowel change. For Burmese speakers, however, there is neither a stress change nor a change of vowel. Similarly there is no vowel alternation in the series "photograph, photography, photographic." Besides due to influence from writing, the speakers display no elision as BrE and AE speakers do in a connected speech. For example, when an alveolar and a palatal glide are immediately adjacent, only S2 displays the palatalization process and produces [dʒ] in "did you," as in AE and BrE.

Consonants in content words are also pronounced according to their spelling. For example, while AE and BrE speakers pronounce the word "singing" as /sɪŋɪŋ/ and "singer" as /sɪŋə (r) / (Ladefoged, 1982, p. 61; Roach, 1991, p. 64), Burmese speakers have /g/ following /ŋ/ at the end of the first syllable.

7) Influence of mother tongue in loan words

English words such as "plaster," "lemon," "film," "manage," "penicillin," "telephone," and "passport" occur in Burmese as loan words. These assume either the stress or the syllable patterns of the Burmese transliterations in the data.

English words	Burmese	Burmese English
plaster	[pəlasəta]	['plʌs'ta]
lemon	[limũ]	['li'mʊn]
film	[pʰəl̃i]	[fiːlms], [faĩs], [flɪn],[fĩs]
manager	[mʌnedza]	['mʌ'netʃ]
penicillin	[pɛnəsəl̃i]	['pɛ'nə'sə'lɪn]
telephone	[tɛlipʰòũ]	['tɛ'li'foun]

8) Suprasegmentals

Stress. Burmese speakers tend to have different stress patterns from AE and BrE in polysyllabic words with different suffixes.

	AE & BrE	Burmese English
Words functioning both as nouns as well as verbs	Display stress contrast	Few display stress contrast
"-ise" or "-ize" suffix	Antepenultimate syllable stress	Final syllable stress
"-ation" suffix	Penultimate syllable stress	Penultimate & final syllable stress
"democrat" and "photograph"	Antepenultimate syllable stress	Final syllable stress
"-ic" suffix	Penultimate syllable stress	Penultimate & final syllable stress
"-y" suffix	Antepenultimate syllable stress	Most stress all syllables

Intonation. In AE and BrE, statements and wh-questions receive a falling intonation while yes-no questions receive a rising intonation. When a tag question receives a falling intonation, it is not a real question but an invitation for the listener to confirm what the speaker has said. If it receives a rising intonation, however, it is a question (Bowen, 1975, p. 184-193). Similarly, Gimson (1989) states that different intonational patterns for requests and commands indicate different attitudes of a native speaker. When requests and commands are said with a low-falling tone at the tail, it indicates the speaker is calm and detached. When the nucleus is the tail, but has a high pre-nuclear pattern, it shows politeness. A gentle command or request is presented with a low-rising nuclear tone, but a relatively high pre-nuclear pattern gives an effect of fresh thought, appeal, or encouragement. To indicate a strong surprise, an exclamation assumes a high-falling intonation (Gimson, 1989, p. 281-288).

Most Burmese speakers display a falling intonation for statements, imperatives, requests, and yes-no questions as well as for tag questions. However, there are no consistent patterns among different speakers for wh-questions and for exclamations. The speakers seem to rely on the syntax of the interrogatives for posing questions.

V. CONCLUSION

Burmese English accent shares features of British, French, Jamaican Creole, and midwestern American English accent, plus features of Burmese. Even though the phonemic inventory in Burmese speakers' English is smaller than AE and BrE, most of the phonemes and the

237

distribution systems are similar to AE and BrE. At the same time, there are distinctive features in Burmese English. For example, occasionally an additional phonetic feature such as nasalization is found in the vowels of the subjects. Moreover, the speakers have lower frequency of syllable-final voiced stops and consonant clusters than the AE and BrE speakers. Where AE and BrE differ in pronunciation, however, Burmese speakers follow BrE. The following characteristics can be summarized as the characteristics of Burmese English accent:

(1) When pronunciation differs between AE and BrE, the Burmese accent is similar to BrE. For example, there is no post-vocalic /r/; "here, there" and "poor" are said as [hiə] or [hiɑ], [ðɛə] or [ðɛɑ], and [puə] or [puɑ].

(2) "Ask" and "desk" may be said as [ɑks] and [dɛks] respectively.

(3) In words such as "occupy" and "opportunity," [kj] and [tj] or [tu] are said with [tɕ].

(4) /θ/ and /ð/ are said with less friction than in AE and BrE.

(5) Unaspirated voiceless stops occur in the syllable-initial position.

(6) Voiced obstruents tend to be devoiced in the syllable-final position.

(7) Glottal stops may appear in the syllable-final position.

(8) Clusters may be simplified either by consonant deletion or by schwa insertion. For example, "test" is said as [tɛs], and "split" is said as [səplɪt].

(9) Elision is absent.

(10) Words such as "four, more" and "store" are pronounced as [fo], [mo], and [sto].

(11) The unstressed vowels are given full vowel values. For example, form words such as "of, a, at," or words such as "photograph" and "democracy" do not have reduced vowels.

(12) [ɑ] instead of [ə] occurs before /r/ so that "prefer" is [prifɑ] instead of [prəfə].

(13) [ɛ] and [ə] occur interchangeably before /l/.

(14) [ɛ] occurs in place of [æ].

(15) In open syllables as well as before /l/ and /s/, [o] and [e] occur instead of [ou] and [ei] as in AE and BrE so that "so" is [so] and "say" is [se].[3]

(16) [au] and [aɪ] may be nasalized in open syllables so that "now" and "my" will be said as [naũ] and [maĩ].

(17) [ɔɪ] in AE and BrE is said as [waɪ]. Thus, "boy" is [bwaɪ], and due to nasalization of the diphthong it may be said as [bwaĩ].

(18) Every syllable receives an equal stress in most polysyllabic words.

(19) Words with suffixes such as "-ation" and "-ic" receive stress both on the penultimate and the final syllable.

(20) Words with suffixes such as "-ise" (or "-ize") and "-ic" receive stress on the final syllable.

(21) The unstressed syllables are pronounced as long as the stressed syllables.

(22) Since every word receives an equal stress in a sentence, there is a syllable-timed rhythm.

(23) Falling intonation is used for all sentence types including Yes-No questions. For Yes-No questions, speakers rely more on syntax than on intonation.

Notes:

[1]Three hundred and twelve words are from Gimson (1989), one hundred and thirty three polysyllabic and compound words as well as twenty eight sentences are from Eltrug (1984).

[2]The passage is on "Interviews" from one of the reading selections for students at Rangoon University.

[3] The simplification of diphthongs /ei/ and /oʊ/ to monophthongs /e/ and /o/ is also found in Guyanese phonology (Wells, 1982) and Nigerian English (Ufomata, 1990).

References

Allyne, M. C. 1980. Comparative Afro-American. A Historical-Comparative Study of English-based Afro-American Dialects of the New World. *Linguistica extranea. Studia, 11.* Ann Arbor: Karoma Publishers, Inc.

Altenberg, E. P. and Vago, R. M. 1987. Theoretical implications of an error analysis of second language phonology production. In Georgette Ioup and Steven H. Weinberger (eds.), *Interlanguage Phonology: The Acquisition of a Second Language Sound System.* 148-164. Series on issues in second language research. Cambridge: Newbury House.

Basson, S. H. 1988. Patterns of Pronunciation Errors in English by Native Japanese and Hebrew Speakers: Interference and Simplification Processes. Dissertation. Bloomington, Indiana: Indiana University Linguistics Club.

Beckman, M.E., and Pierrehumbert, J.B. 1986. Intonational structure in Japanese and English. In C. Ewen and E. Anderson (eds.). *Phonology Yearbook.* 3: 255-309. Cambridge, MA: Cambridge University Press.

Bowen, J. D. 1975. *Patterns of English pronunciation.* Rowley, MA: Newbury House.

Dickerson, L. 1975. Interlanguage as a system of variable rules. *TESOL Quarterly.* 9: 401-07.

Eltrug, N. S. 1984. Analysis of the Arab Learner's Errors in Pronunciation of English Utterance in Isolation and Context. Dissertation. Ann Arbor, MI: University Microfilms International.

239

Flege, J. E. and Port, R. 1981. Cross-language phonetic interference: Arabic to English. *Language and Speech*. 24 (2): 125-46.

Flege, J. E. and Davidian, R. D. 1984. Transfer and developmental processes in adult foreign language speech production. *Applied Psycholinguistics*. 5: 323-47.

Gimson, A. C. 1989. *An Introduction to the Pronunciation of English* (4th ed.). Revised by S. Ramsaran. New York: Edward Arnold.

Han-Tin. 1990. ELT in Myanmar: Key Issues. Keynote Address. In *Country English Language Teaching Programme*. Institute of Foreign Languages: Yangon.

Heine, B. 1979. Some linguistic characteristics of African-based pidgins. In Hancock, I. F. (Ed.) *Readings in Creole Studies*. 89-98. Ghent, Belgium: E. Story-Scientia Gent.

Juffs, A. 1990. Tone, syllable structure and interlanguage phonology: Chinese learners' stress errors. *IRAL*. 28: 99-117.

Koster, C. J. and Koet, T. 1993. The evaluation of accent in the English of Dutchmen. *Language Learning*. 43 (1): 69-92.

Ladefoged, P. 1982. *A Course in Phonetics* (2nd ed.). San Diego: Harcourt Brace Jovanovich.

Major, R. C. 1987. A model for interlanguage phonology. In G. Ioup and S. H. Weinberger (Eds.), *Interlanguage Phonology: The Acquisition of a Second Language Sound System*. 101-124. Series on issues in second language research. Cambridge: Newbury House.

_____. 1986. Paragoge and Degree of Foreign Accent in Brazilian English. *Second Language Research*. 2 (1): 53-71.

Mohanan, K.P. 1992 Describing the phonology of non-native varieties of a language. *World Englishes*. 11, 2/3: 111-128.

Munro, M. J. 1993. Productions of English vowels by native speakers of Arabic: Acoustic measurements and accentedness ratings. *Language and Speech*, 36 (1), 39-66.

Nemser, W. 1971. *An Experimental Study of Phonological Interference in the English of Hungarians*. Bloomington: Indiana University.

Roach, P. 1991. *English Phonetics and Phonology: A Practical Course* (2nd ed.). Cambridge: Cambridge UP.

Suenobu, M., Kanzaki, K. and Yamane, S. 1992. An experimental study of intelligibility of Japanese English. *IRAL* 30 (2), 146-156.

Sheldon, A. and Strange, W. 1982. The acquisition of /r/ and /l/ by Japanese learners of English: Evidence that speech production can precede speech perception. *Applied Psycholinguistics*, 3.243-61.

Tay, M.W. J. 1982. The phonology of educated Singapore English. *English World Wide*, 3 (2), 135-45.

Thompson, I. 1991. Foreign accents revisited: The English pronunciation of Russian immigrants. *Language Learning*, 41 (2), 177-204.

Ufomata, T. 1990. Acceptable models for TEFL (with special reference to Nigeria). In S. Ramsaran (ed) *Studies in the Pronunciation of English: A Commemorative Volume in Honour of A. C. Gimson.* 212-216. London: Routledge.

Wells, J.C. 1982. *Accents of English: Beyond the British Isles.* Vol. 3 Cambridge: Cambridge University Press.

Young-Scholten, M. 1995. The negative effects of 'positive' evidence on L2 phonology. In L. Eubank, L. Selinker, M. S. Smith (eds.) *The Current State of Interlanguage.* 107-21. Studies in honor of William E. Rutherford. Amsterdam/Philadelphia: John Benjamins.

Zughdul, M. R. M. (1979). Phonological Error Analysis of the Spoken English of Arab Students: The Segmental Phonemes. Dissertation. University of Texas, Austin.

TOWARDS AN ANALYSIS OF THE SOUTH MUNDA[1] VERBAL SYSTEM

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1 Introduction

One of the vexing issues in the comparative analysis of the Austroasiatic group of languages is the obvious typological difference between the complex (polysynthetic, agglutinative) Munda verb and the seemingly isolating structure preferred by the bulk of Mon-Khmer languages.[2] In this paper we examine the South Munda group of languages, working towards a reconstruction of the Proto-South Munda verbal system. Following a careful comparison of the various South Munda subgroups and the corresponding resultant intermediate proto-languages, the Proto-South Munda verbal system is now beginning to become clearer. When stripping away the various systems of progressive and perfective marking which seem to be innovations within the history of individual languages or subgroups, predominantly calqued on areal models (Hook 1991), one is still left with a large component of truly Munda features, frequently lacking analogs in other surrounding languages of the Indian subcontinent. The only previous analysis of South Munda verb structure (Pinnow 1966) lacks sufficient data from Gutob-Remo-Gta? and Gorum,[3] languages which, it turns out, are extremely important to our understanding of the ancestral verb structure. In the present study we discuss the following categories morphologically indexed in the Proto-South Munda verb: person, tense, mood and negation,[4] offering parallels with other Austroasiatic languages when warranted.

2 Person

Correspondences among the various South Munda languages suggest that both subject [SUBJ] and object [OBJ] were marked affixally in the South Munda verb. SUBJ markers were probably prefixal and OBJ markers suffixal in the proto-language. This is preserved in both Juang and Gorum, while Gta? has preserved the SUBJ agreement prefixes and Sora, in part, the OBJ suffixes. Various languages have only suffixal or enclitic person agreement with the SUBJ alone (Kharia, Gutob, Remo); in these instances this likely reflects a later encliticization of the pronominal forms following areal norms.[5] In Sora, on the other hand, there seems to have been a genuine shift in interpretation of the role of the person indexed by the agreement suffixes from OBJ to SUBJ in particular verb classes.[6] PSJG lost the PSM duals and the inclusive/exclusive contrast for first person; the other daughters of PSM preserved this. North Munda subject clitic- and object-marking phenomena are theoretically challenging (see Sadock (1991) on

243

marking phenomena are theoretically challenging (see Sadock (1991) on Santali, or G. Anderson (1995-ms.) for more on NM in general). While Proto-Munda probably had both SUBJ prefixes and OBJ suffixes, the issues are complicated and beyond the scope of the present study. For a list of person markers in SM languages, see Table-I.

SUBJ

	1	1DLi	1DLe	1PLi	1PLe	2
Kharia	-ñ/ŋ	-naŋ	-jar	-niŋ	-le	-m
Juang	-V₁-	ba-			nV₍₁₎-	mV₍₁₎-
Sora	-ay			-be	ə-..-ay	*
Gorum	ne-				le-	mo-
Gutob	-niŋ				-nei	-nom
Remo	-(n)iŋ	-naŋ			-nay	-no
Gta?	N̥-	ni-		næ/ne-	næ?/ne?·	na-

	2DL	2PL	3	3DL	3PL
Kharia	-bar	-pe	--	-ki-yaɪ	-ki
Juang	ha-	V₁-	--	-ki-a	-ki
Sora		ə-..-ɛ	--		-ji
Gorum		bo-	--		-gi
Gutob		-pen	--		-nen
Remo	-pa	-pe	--		
Gta?	pa-	pe-	--		-har-

OBJ

	1	1DL	1PL	2	2DL
Juang	-(ni)ñ	-ñ-ba	-nen-iñ	-(n)(ɔ)m	-pa
Sora	-iñ	-ay	-lɛn/ŋ	-əm	
Gorum	-iŋ		-ileŋ	-om	

	2PL	3	3DL	3PL
Juang	-pe	--	(-ki-a)	(-ki)
Sora	-bɛn	-e		-ji
Gorum	-ibeŋ			(-gi)

244

Table-I South Munda Person Markers

(1) <u>Juang</u> (Matson 1964, Pinnow 1960-ms.)

mɛ-jɔ-ki-ñ   n-ɔn-de   ba-sɔŋ-a
[2-'see'-PRES.II-1]   [1PL-'go'-PRES.I]   [1DL-'buy'-FUT.II]
'you see me'   'we go'   'we 2 will buy'

jɔ:-k-ɔm   tele-ɔ-ñ   te-me-le-niñ
['see'.1-PRES.II-2]   ['push'-PAST.II-1]   ['push'-3FUT-'push'-
1]
'I see you'   'he pushed me'   'he will push me'

<u>Sora</u>   (Ramamurti 1931)   <u>Gorum</u> (Aze 1973)
uruŋ-l-iñ   mo-taʔy-iŋ
['take'-PAST-1]   [2-'give'-1]
'(you) took me'   'you gave me (money)'

an-uruŋ-l-am   ne-aʔy-t-om
[NEG-'take'-PAST-2]   [1'splash'-NPAST-2]
'(I) didn't take you'   'I will splash you'

<u>Remo</u> (Fernandez 1968)
way-t-iŋ way-oʔ-niŋ   i-g-niŋ   sum-oʔ-no-ki
['call'-NPAST-1]['call'-PAST.II-1]   ['return'-PAST.I-1]   ['eat'-PAST.]
Q]
'I call'   'I called'   'I returned'   'did you eat?'

<u>Gutob</u> (N. Zide 1997, field notes)
suŋ-to-niŋ   suŋ-oʔ-nom
['throw'-CUST-1]   ['throw'-PAST.II-2]
'I throw'   'you threw'

<u>Gtaʔ</u> (K. Mahapatra et al. 1989)
Ṇ-coŋ-ke   Ṇ-coŋ-ge
[1-'eat'-**ke**]   [1-'eat'-PAST]
'I ate'   'I ate'

Note that prefixal agreement markers for subject are not unique to Munda among Austroasiatic languages. They are found, for example, in such Aslian languages as Temiar:

245

(2) <u>Temiar</u> (Carey 1961)
kəʔan kəʔa-sɛhluh   ʔi-səluh ñam ʔim-rec
['you.2'] [2DL-'blow.pipe']   [1-'shoot'] ['animal'] [1-'eat']
'you 2 are blow-piping'   'I shot an animal to eat'

tɔʔ ha-reñrec sec mɛjmɛj naʔ
[NEG] [2-'eat'] ['meat'] ['excellent'] ['that']
'(why) didn't you eat that excellent meat'

Certain other Mon-Khmer languages, exhibit an interesting use of a resumptive pronoun in immediately preverbal position, as well as a lexically restricted bound pronominal allomorph. This may be viewed as a kind of incipient prefixal agreement system:

(3) <u>Pacŏh</u> (Watson 1964)
a-ám anhi acân ŋai pôc   ŋép u-lúh
['fathers'] ['uncles'] [FUT] [3PL 'go']   [non-sing] [3-'run']
'fathers and uncles will go'   'they all ran away'

Pronominal doubling is found in other Mon-Khmer languages as well, e.g. Katu.

(4) <u>Katu</u> (Wallace 1966)
dó dâh dó gamak   yi 'bóδr pe jaal yi chô
['he']['quickly']['he'   'become.big']   ['we']['2']['3']['times']['we'
'return']
'he quickly became big'   'we returned two or three times'

3 Tense-Aspect

       One of the basic distinctions in the tense-aspect systems of the Munda languages is between past [PAST] and nonpast [NPAST] ('present-future'), both realized affixally; in NM the same basic distinction holds, but only past is marked.[7] PKJ, and, independently and differently, Gutob and Gtaʔ, each have developed future tenses, but there is no reason to reconstruct these for PSM.

       Of the morphological aspectual forms, PKJ had a perfective, but this looks like an innovation. The Remo perfect, on the other hand, might be old, see below.[8] The reduplicated infinitival present in Gutob (functioning as a finite habitual aspect form) is found elsewhere in Munda, and in Mon-Khmer. For a summary of the tense-aspect markers in SM see Table-II.

	Kharia	Juang	Gutob	Remo
PAST.I	-ki	-an	-gu. -gi	-gi, -ga
PAST.II	-og/ʔ	-ɔ	-ɔʔ	-ɔʔ
NPAST.I[9]	-ta	-de	-to [CUST]	-te ~ -ta
NPAST.II	-te	-ke	-to [CUST]	-to
FUT.I	-na	-na	-loŋ	
FUT.II	-e	-e	-tu	

	Gtaʔ	Sora	Gorum
PAST.I	-ge/-ke	-le	-rV
PAST.II	-ge/-ke	-le	-rV
NPAST.I	(-ke)	-te (~ -tɛ)	-tV
NPAST.II	(-ke)	-te (~ -tɛ)	-tV
FUT	+e		

Table-II South Munda Tense-Aspect Markers

In Proto-South Munda, two series of tense markers seem to have been used, contrasting class-I (Intransitive) and class-II (Transitive). For the PAST, this formal opposition is straighforwardly attributable to Proto-South Munda. The PAST marker used with transitives/class-II verbs was *-og/ʔ,[10] while the corresponding marker for intransitives/class-I was *-g/kE. Kharia, Gutob and Remo preserve this system directly. Juang lacks the latter affix, Gtaʔ the former, and both were lost during the formation of Proto-Sora-Gorum, which has *-le instead.[11] In PGRG, there were the following forms: *-gi PAST.I and *-ɔʔ PAST.II. Gtaʔ has restructured this completely: the two past forms (the -ge PAST and the -ke PAST) both have a complex range of functions, some quite restricted, not directly corresponding to the transitive/intransitive contrasts of Gutob, Remo, and PGRG. Note that the Hill Gtaʔ form corresponding to the loosely imperfective -ke of Plains Gtaʔ is -ti.[12] This suggests that the Gtaʔ -ke/-ti PAST reflects something of the Proto-South-Munda NPAST; it probably also reflects something of the ancestor of the more obscure Hill Remo -ki, see below.

(7) Kharia (Malhotra 1982, Biligiri 1965a)
ob-ñoʔ-oʔ   gitag-ki-moy   kui-ki
[CAUS-'eat'-PAST-PL]   ['sleep'-PAST.I-3PL]   ['find'-PAST.I]
'she fed'   'they slept'   'was found'[13]

247

Juang   (B. Mahapatra 1976)   Gta? (K. Mahapatra et al. 1989)
keḍab-ɔ   *gitu-an*   *N̥-coŋ-ge*   *N̥-coŋ-ke*
['bite'-PAST.II] ['sing'-PAST.I]   [1-'eat'-PAST]   [1-'eat'-**ke**]
'he bit'   'she sang'   'I ate'   'I ate'

Gutob   (N. Zide, field notes)   Remo (Bhattacharya 1968)
ser-gu   *som-oʔ*   *gay-g-niŋ*   *baḍ-oʔ-niŋ*
['sing'-PAST]   ['eat'-PAST]   ['enter'-PAST-1]   ['slap'-PAST-1]
's/he sang'   's/he ate'   'I entered'   'I slapped'

Correspondences between Kharia and Sora-Gorum are suggestive that class-I and class-II NPAST were formally distinguished in PSM as well. These were marked by a *-t-*initial suffix, with differing vocalism for the two classes. The NPAST was either present or future in meaning. It is possible that Juang *-de* is cognate with Kharia *-te* and is thus an old marker, otherwise the marker seems to have been lost in this language. Proto Gutob-Remo had *$*-tV$ NPAST.I and NPAST.II, which was also probably differentiated by the quality of the vowel. Plains Gta? has lost any *-t-*initial NPAST marker, but it was probably (partially) preserved in the Hill/Riverside Gta? *-ti*. In Plains Gta?, all functions of Hill Gta? *-ti* < PSM *$*-tV$ have been replaced by *-ke*, possibly aspectual in origin. In Gutob, PGR(G) *tV- has been preserved, but specialized in the function of a customary present *(-to)* [CUST]; this affix may also be the historical source for the Gutob FUT.II in *-tu*. Remo *(-ta/-te, -to)* may have maintained the PGRG (PSM) vowel opposition in the NPAST, or at least reflect this contrast.

(8) Sora (Ramamurti 1931, Starosta 1967, Biligiri 1965b)

kuŋ-bəb-t-ɛ   *kuŋ-bəb-te-n*
['shave'-'head'-NPAST]   ['shave'-'head'-NPAST-I]
'you shave (s.o.'s) head'   'you shave your head'
ə-gi-j-t-iñ   *anin iɛr-tɛ*
[2PL-'see'-NPAST-1]   ['s/he'] ['go'-NPAST]
'y'all will see me'   's/he is going'

Gorum   (A. Zide field notes, Aze 1973)
miŋ ne-i-tuʔ   *mo-taʔy-t-iŋ*   *ne-laʔ-tuʔ*
['I'] [1-'go'-NPAST] [2SUBJ-'give'-NPAST-1OBJ] [1-'hit'-NPAST]
'I'll go'   'you will give (it) to me' 'I'll hit (myself)'

248

Remo (Bhattacharya 1968)

bɔp-t-iŋ   *goy-ta*

['head'-NPAST-1]   ['die'-NPAST.I]

'I shall make him head (of a village)'   's/he will die'

Gutob (N. Zide, field notes)

seser   *ser-loŋ*   *ser-to*

[R.'sing']   ['sing'-FUT]   ['sing'-CUST]

'sings'   'will sing'   'sings'

Kharia (Malhotra 1982, Biligiri 1965a)

gitag-na   *gitag-ta-ñ*   *um-yoʔ-ta*

['sleep'-FUT.I]   ['sleep'-PRES.I-1]   [NEG-'see'-PRES.I]

'she will sleep'   'I sleep'   'are not seen'

The future [FUT] is clearly secondary in South Munda languages. In Proto-Kharia-Juang, a future series was innovated for class-I (*-na*) and class-II (*-e*). Both are probably modal in origin: *-na* < the PSM imperative.I marker *-la*, and *-e* corresponds to the MOD *-e* affix in Remo and the OPT in Gutob. Note that the PKJ FUT.II in *-e* is not cognate with the Gtaʔ FUT marker +*e*, (e.g. *n-coŋ+e* [1-'eat'+FUT] 'I will eat'); this latter form is rather probably cognate with the Gutob present participle +*el*. The Gutob future transitive morpheme *-tu* is likely to have come from an earlier NPAST, but no source for the intransitive *-loŋ* has been found.

Remo, unlike the closely related Gutob and most other South Munda languages, does not directly borrow (or calque) an auxiliary construction to make present perfect and past perfect verb forms. Instead these consist of two tense/aspect markers following the verb stem, e.g. *bad-ɔʔ-t-iŋ* ['slap'-PAST.II-NPAST-1] 'I have slapped' vs. *bad-ɔʔ-ki-niŋ* ['slap'-PAST.II-PERF-1] 'I had slapped', with the otherwise non-occuring *-ki* perfect [PERF] marker. Do we reconstruct a Hill-Remo like perfective for PSM? Maybe; however, no relatable morphology or syntax in the other SM languages has been noted. It is possible that the Gtaʔ PAST marker in *-ke* may be cognate with the Hill Remo PERF *-ki,* and/or the Juang PRES.II in *-ke*. Plains Gtaʔ *-ke* may carry a present tense meaning, as well as an imperfect(ive) one, e.g. *na-coŋ-ke* [2-'eat'-ke] 'you eat, you ate'. Another function, probably quite old, is one of focus. A fuller picture of the various functions of *-ke* (and its opposition to *-ge*) in Gtaʔ must await further research.

4 Imperatives (and Other Modals)

Imperative forms in Proto-South-Munda may have also been divided into two formal classes, transitives and intransitives. This categorical opposition could be realized in a variety of ways, i) through the presence of a suffix with one class and its lack with the other, or ii) the possibility of a verb indexing a single referent or two referents, or iii) the possiblity of taking OBJ marking, in the case of Sora. Rather than being marked by a prefix as in the indicative, the SUBJ markers were suffixed in Proto-South-Munda, following the OBJ markers. This is preserved in Sora, and without the OBJ marking in Kharia; note that this has parallels in North Munda as well. Proto-Gutob-Remo kept the PSM formal opposition of intransitive imperatives marked by the affix *-(l)a vs. unmarked transitive imperatives. Gta? preserves this in a direct way only in a certain subset of intransitive verbs (of positioning and motion) that take -la. Kharia-Juang preserved the imperative as *-na and innovated an overt IMP.II in *-e from an originally optative/modal meaning.[14] This latter modal suffix was preserved in PGR and its modern attested daughter languages.

(9) Kharia (Malhotra 1982, Biligiri 1965a)

ñog-e-(m)	ḍoko-na-(m)	ñog-e-bar
['eat'-FUT.II-(2)]	['sit'-FUT.I-(2)]	['eat'-FUT.II-2DL]
'eat (it)!'	'sit!'	'Please eat!'

Juang (Mahapatra & Matson 1962-ms)   Sora (Biligiri 1965b)

ḍiñ-i-ñ	ḍiñ-e-neniñ	gij-iñ-ba
['give'-FUT-1]	['give'-FUT-1DL]	['see'-1-2PL]
'give me'	'give (it) to us 2'	'(y'all) see me!'

Gta? (K. Mahapatra et al. 1989)

coŋ	coŋ-pa	coŋ-pe	coŋ-le?	ko-la
['eat']	['eat'-2DL]	['eat'-2PL]	['eat'-HORT]	['sit'-IMP]
'eat!'	'eat you 2!'	'eat y'all!'	'let him eat'	'sit!'

Remo (Bhattacharya 1968, Fernandez 1968)

bɔ?-ba	bug-e	ɔ-gɔi
['head'-IMP]	['beat'-MOD]	[CAUS-'die']
'become a head'	'he should beat (you)'	'kill'

kuma-la	sum-le	sum-niŋ
['bathe.self'-IMP]	['eat'-MOD]	['eat'-1]
'have a bath'	'(you) should eat'	'let me eat'

Gutob (N. Zide, field notes)

ser-a   *ser-e*
['sing'-IMP]   ['sing'-OPT]
'sing!'   'let sing!, may sing!'

5 Negation

There are two negative [NEG] prefixes or particles that were apparently used in the PSM verb system. These appeared with finite declarative, non-declarative, and non-finite verbs. One of these NEG markers is *a(r)- and the other *a/u(m)(bO).

Both negative markers are used in Gorum and Juang, while Sora and the GRG languages reflect *a(r)- only. Kharia also shows both etymological negative markers, with the *a(r)- used only in the prohibitive and the *a/um- only in finite clauses. Whether this is an old pattern or an innovation remains an open question. Note that negative copulae (such as *jena* in Juang) are used in some formations. In Sora, the NEG prefix may also appear suffixed in certain (non-tense-marked) past forms, in a doubly-marked construction (10).

(10) Sora (Starosta 1967, Ramaurti 1931, Biligiri 1965b)

ədn-ed-l-ɛ   *a-gij-lə-be*
[NEG-'scratch'-PAST(-3)]   [NEG-'see'-PAST-1inclPL]
'he didn't scratch'   'we (incl) didn't see him'[15]

aḍ-jum-aḍ   *əʔ-ti-əʔ*   *əʔ-ñaŋ-əʔ*
[NEG-'eat'-NEG]   [NEG-'give'-NEG]   [NEG-'take'-NEG]
'you, (s)he did not eat' 'didn't give'   'didn't take'

Gorum (Aze 1973) *ar-, or-*
<u>*ar-*</u>
ar-samaʔn-n-iʔŋ
[NEG-'recognize'-I-1.OBJ]
'it was not recognized by me'

<u>*or-*</u>
buboŋ-di or-orʔiŋ-tuʔ   *or-alam*
['baby'-FOC] [NEG-'walk'-I]   [NEG-'touch']
'the baby can't walk'   'don't touch'

ambu alam   'don't touch'

251

abu co-na-(m)   *ag-bar co-na*   *ag-pe ñog-e*
[PHB.2] ['go'-FUT.I-(2)] [PHB-2DL] ['go'-FUT.I] [PHB-2PL] ['eat'-FUT.II]
'don't go!'   'don't go, you 2!' 'don't eat, y'all!'

um-iñ co-na   *um ñok'-og*   *um karay-kon*
[NEG-1] ['go'-FUT.I]   [NEG] ['eat'-PAST.T]   [NEG] ['do'-NF]
'I will not go'   'he did not eat' 'not having done'

um-em co-na   *um co-na-m*
[NEG-2] ['go'-FUT.I]   [NEG] ['go'-FUT.I-2]
'you will not go' 'you will not go'

umbo colcol   *umbo ño?ño?*
['no'] [Rdpl. 'go']   ['no'] [R. 'eat']
'I cannot go'   'I cannot eat'

Juang (Mahapatra & Matson 1962-ms, Matson 1964, Pinnow 1960-ms.)
añ koŋkoŋ jena   *ba-ama-gito-ke jena*   *ar-aitog-ki-ki jena*
['I'] [R.'know'] [NEG]   [1DL-NEG-'sing'-   [NEG-'scratch'-
                            PRES.II] [NEG]   PRES.II-PL][NEG]
'I don't know'   'we 2 don't know'   'they   aren't/won't
                                                        be scratching'

Negative marking in the GRG languages presents a more complicated picture. First, main and subordinate clauses are differentiatied by the negative prefix used. In main clauses **ar-* was found in PGRG (< PSM **ar-*), while in subordinate clauses **mɔr-* was used (cf. Gta? *mɔ-* Gutob *mɔr-,* < pre-PGRG **mV-ar*, possibly < PSM **(a)mV-ar*, i.e. a doubly-marked negative). The prohibitive in PGRG consisted of the NEG prefix combined with the use of a *PAST* tense morpheme, e.g. **ar-X-gi* or **ar-X-ɔ?*. This is preserved in Gutob and Remo, but in Gta?, only the etymological PGRG PAST.I form in **-gi* is used (since PGRG (and PSM) **-ɔ?* was lost in pre-Gta?). In addition, the negative forms of *past* tenses in PGRG seem to have used *NPAST* suffixes, e.g. **ar-X-tV*.[17] PGRG **ar-X-tV* was preserved as Gutob *ar-X-to*, Hill Gta? *a?-X-ti*, (and following the developments mentioned above in pre-Gta?) Plains Gta? *a(r)-X-ke* (-*r*-appearing before V-initial stems, e.g. ones starting with the causative *a?-*). In P(roto-) Remo, the PAST.II marker was added to the opaque PGRG form, **ar-X-tV* yielding PRemo **a(r)-X-tV-ɔ?*.[18] This was preserved in Hill Remo (*a-X-tV-ɔ?*), but Plains Remo lost the **-tV-*, yielding *a-X-ɔ?*. Some negative forms, e.g. the Gutob negative customary and negative habitual,

are marked not with the prefix, but with a negative copula and a reduplicated infinitive (verbal noun).

(11) Gutob (N. Zide field notes)

ar-ser-gu	seser ar-ḍu-gu	seser aṛ u/ik-e
[NEG-'sing'-PAST.I]	[R.'sing'] [NEG-AUX-PAST.I]	[R.'sing'] [NEG-AUX-OPT]
'don't sing'	'don't be singing'	'no singing'

seser uraʔ/oroj	ar-ser-a	ar-ser-to
[R.'sing'] [NEG]	[NEG-'sing'-NEG.FUT]	[NEG-'sing'-NEG.PAST]
'doesn't sing'	'won't sing'	'didn't sing'

ar-ser-e	ser-gu nu/ḍu uraʔ/oroj	seser ar-ḍu-to
[NEG-'sing'-OPT]	['sing'-PAST.I] [AUX] [NEG]	[R.'sing'][NEG-AUX-CUST]
'may not sing'	'has not sung'	'had not sung'

seser uraʔ/oroj ḍu-gu	seser uraʔ/oroj ḍu-loŋ	seser ar-ḍuk-a
[R.'sing'] [NEG] [AUX-PAST.I]	[R.'sing'] [NEG] [AUX-FUT.I]	[R.'sing'] [NEG-AUX-IMP]
'was not singing'	'will not be singing'	'don't be singing'

Remo (Bhattacharya 1968)

a-o-goi-oʔ	a-kuma-ga
[NEG-CAUS-'die'-PAST.II]	[NEG-'bathe.self'-PAST.I]
'don't kill!'	'don't bathe!'

Gtaʔ (Mahapatra et al. 1989)

a-coŋ-ge	a-coŋ-le
[NEG-'eat'-PAST]	[NEG-'eat'-HORT]
'don't eat!'	'don't let him eat, may s/he not eat'

Ṇ-á-coŋ-ke[19]	c-coŋ Ṇ-á-ḍiŋ-ge	coŋ Ṇ-á-læʔ-ke
[1-NEG-'eat'-ke]	[R.'eat'] [1-NEG-AUX-PAST]	['eat'] [1-NEG-AUX-ke]
'I didn't eat'	'I wasn't eating'	'I hadn't eaten'

c-coŋ Ṇ-á-miaʔ-ke	coŋ Ṇ-á-ḍiŋ-ke	coŋ Ṇ-á-læʔ
[R.'eat'] [1-NEG-AUX-ke]	['eat'] [1-NEG-AUX-ke]	['eat'] [1-NEG-AUX]
'I don't eat'	'I am not eating'	'I have not eaten'

Ṇ-ár-aʔ-coŋ-ke   Ṇ-á-coŋ   c-coŋ Ṇ-á-ḍiŋ
[1-NEG-CAUS-'eat'-ke] [1-NEG-'eat']   [R.'eat'][1-NEG-AUX]
'I didn't feed (s.o.)' 'I won't/wouldn't eat' 'I won't be eating'

　　　　While direct cognates of the Munda NEG prefix are (as of yet) unknown elsewhere in Mon-Khmer, Bahnar does have a prefixal NEG marker, e.g. <u>Bahnar</u> (Banker 1964: 117) ĭnh kobằt ['I'] [NEG-'know'] 'I don't know' (also ĭnh uh kobằt ['I'] ['not'] [NEG-'know']).

6 Conclusions
　　　　Thus, it has been seen that verbal affixation processes in Proto-South Munda probably included prefixation, infixation, suffixation, and possibly ambifixation as well (for the Gtaʔ reciprocal). Certain correspondences between PNM and PSM are likely to be features of Proto-Munda (person marking, some kind of tense/aspect/mood marking, etc.), despite the fact that North Munda verb morphology is largely suffixal and probably largely innovated. The common assumption about (Proto-) Austroasiatic is that it lacked inflectional morphology.[20] This assumption needs to be demonstrated. There is no question that Munda syntax--which favors SOV constituent order, with possible vestiges of SVO in SM--is very different from Mon-Khmer syntax--where SVO is the rule. This is not an insurmountable problem, as shifts in sentential constituent order to reflect areal norms is well-known in the history of many languages. However, before we can begin to formulate a more exact understanding of comparative Austroasiatic morphosyntax, careful and precise low-level comparisons of individual Mon-Khmer subgroups will be necessary to ultimately arrive at a Proto-Mon-Khmer morphosyntax. Only then will there be the possiblity of having a basis for comparison with our emerging picture of Proto-Munda morphosyntax. We hope that the present study constitutes the first step down this long-road to a comparative Austroasiatic morphosyntax.

Abbreviations Used:

AUX	Auxiliary	BEN	Benefactive	CAUS	Causative
CL	Cislocative	CMPL	Completive	CONT	Continuative
CUST	Customary	DESID	Desiderative	DL	Dual
e	exclusive	i	inclusive	I	Intransitive
MOD	Modal	Ṇ	syllabic nasal	NEG	Negative
NF	Non-Finite	NPAST	Non-past	OBJ	Object
OPT	Optative	PASS	Passive	PERF	Perfect(ive)

254

PHB	Prohibitive	PL	Plural	POSS	Possessive
PRES	Present	Q	Interrogative	R.	Reduplicated
RECIP	Reciprocal	RFLXV	Reflexive	TLOC	Translocative
1	first person	2	second person	3	third person

Notes

[1] There are nine South Munda languages spoken by fewer than a million total people in eastern India in the state of Orissa and adjacent parts of neighboring states. The three subgroups of the South Munda languages consist of Kharia-Juang (made up of Kharia and Juang) , Gutob-Remo-Gta? (Gutob (Gadaba), Remo (Bon~d~a), Plains Gta? (D~id~ayi, D~id~ei) and Hill Gta?) and Sora-(Juray)-Gorum (Sora (Saora), Juray and Gorum (Pareng(i/a)).

[2] For example, <u>Kharia</u> (Malhotra 1982) *d~od~-kay-t~u-d~om-bha?-god~-na-m* ['carry'-BEN-TLOC-PASS-'quickly'-COMPLT-FUT-2] 'get yourself there for me quickly', *kol-kui-bha?-god~-ki-kiyar* [RECIP-'find'-'quickly'-COMPLT-PAST.I-DL] 'both of them found each other quickly'; <u>Sora</u> (Ramamurti 1931) *ji-lo:'-je⊥t-am* ['stick'-'mud'-'leg'-NPAST-2] 'mud will stick to your leg', *pa⊥ti-dar-iñ-te:n* ['bring'-'give'-'cooked.rice'-1-3.PAST] 'he brought and gave me cooked rice'; <u>Remo</u> (Fernandez 1983) *gɘ-gay-d~uso?-kɘ-ga* [R.'enter'-'DESID-**ke**-PAST] 'he wanted to enter', *bad~-o?-su⊥o?-niᴶ* ['slap'-PAST-COMPLT-PAST-1] 'I finished slapping'. Note that polymorphemic words are attested in certain Mon-Khmer languages however, e.g. <u>Katu</u> (Costello 1966) *tapachariat* [RECIP-CAUS-'cold'] 'make e.o.'s rice cold', *tapagluh* [RECIP-CAUS-'go.outside'] 'make e.o.go outside', *tapasaruum* [RECIP-CAUS-'fall'] 'cause e.o. to fall' or <u>Bahnar</u> (Banker 1964) *jo'po'lôch* [PERF-CAUS-'die'] 'to have killed', *jo'to'yaih* [PERF-PASS-'untie'] 'to have been untied'.

[3] Pinnow's (1966) thorough treatment of the Munda verb written almost forty years ago has comparatively little we can use here since only one of the SM subfamilies (Kharia-Juang) was adequately described (largely by Pinnow himself) at the time he wrote. For only one other SM language, Sora, was there then any good data, and Pinnow was forced to see SM as rather like Sora--which it isn't--and Kharia-Juang. Pinnow's analyses and his general conclusions, e.g. on tense/aspect, are quite relevant, but to a broader, more complete analysis of the Munda verb than we can give here.

[4] This doesn't exhaust the morphologically marked verbal categories in the SM languages, for example, the conjunctive clausal clitic, cf. PGRG *-či(?)* Juang *-jɔ* or the causative in *Vb-, *-(V)b-; space does not allow us to address these here.

⁵ Compare Gtaʔ *n-coŋ-ke* [1-'eat'-PAST] and Gutob *som-oʔ-niŋ* ['eat'-PAST.II-1], both meaning 'I ate'.

⁶ Note for for the most part, Sora does not mark subject on the verb form itself at all, but rather syntactically with independent pronouns, which themselves are often omitted and contextually understood.

⁷ The NPAST forms in NM have a finitizing 'predicator' suffix (-*a* in Kherwarian, -*bà/-ò* in Korku) suffixed to a non-finite verbal noun.

⁸ The SM languages as a whole are short on auxiliary verb constructions, which generally perform aspectual functions. Most of those found (including the perfective and progressive forms central to the verb systems of some SM languages) are fairly recent borrowings (or calques). For example, the richer systems of North Munda auxiliaries are borrowed from or calqued on the basis of Hindi, with its elaborate set of auxiliary verbs. This contrasts with the less developed auxiliary verb system of the GRG languages that have borrowed auxiliary formations from Desia Oriya, with its more restricted range of auxiliaries.

⁹ Glossed as the PRES.I and PRES.II in Kharia and Juang.

¹⁰ The PSM Transitive PAST.II in *-ɔʔ* looks to be cognate with the NM transitive past in -*èʔ/--ɛʔ/-ed*. The PNM *ɛ : PSM *ɔ correspondence is well-known, e.g. PNM *mɛd* PSM *mɔd* ~ *məd* 'eye'. A formal opposition of intransitive and transitive imperatives is also found in NM as well. Space does not permit us to adequately address the implications of our PSM reconstructions to comparative NM data.

¹¹ Note that [PAST] can be Ø-marked in Juray and Gorum in as of yet unknown circumstances, e.g. Juray (A. Zide 1983) *jom-ɛn-gi* ['eat'-I-PL] 'they ate', Gorum *guloŋ-iŋ* ['call'-1] 'he called me'. On the other hand, double-marking of [PAST] is the rule in Gorum AUX constructions: Gorum *miŋ ne-adaʔ-ruʔ ne-k-ruʔ* ['I'] [1-'thirst'-PAST] [1-AUX-PAST] 'I was thirsty'; this is paralleled in Gutob and Remo: Gutob (Hook 1991: 185) *bobrig-oʔ ber-oʔ* ['enter'.CAUS-PAST.II] [AUX-PAST.II] 'made enter'; Remo (Hook 1991: 187) *len-oʔ sun-oʔ sit* ['thresh'-PAST.II] [AUX-PAST.II] [Conjunctive.Particle] 'having threshed'. Also, according to Starosta (1967: 141) and Ramamurti (1931) Sora has an alternative [3.PAST] form in -*ete:n/-ete:d,* e.g. *jer-e:ten* ['go'-3.PAST] 's/he went' *jer-a:i-te:n* ['go'-CL-3.PAST] 's/he came'. This is apparently the unmarked form for [PAST] in the villages of Gumna (-*ete:n*) and Serango (-*ete:d*).

¹² For example, Plains Gtaʔ *Ṇ-coŋ-ke* [1-'eat'-ke] vs. Hill Gtaʔ *Ṇ-coŋ-ti* [1-'eat'-**ti**] both meaning 'I ate' or 'I eat'.

¹³ Note the 'passivizing' or 'detransitivizing' effect of the use of the class-I (or 'intransitive') affixes with a semantically bi-valent verb that is typical of Kharia and Juang.

[14] It is also possible that Proto-Kharia-Juang reflects a very old feature here, with transitive verbs lacking a pronominal object marked by an inanimate object marker in *-e. This pattern was seen in Proto-North Munda as well. Of course, PKJ *-e could reflect both the modal *-e and the inanimate *-e.

[15] Note that the combination of the [NEG] prefix with the pronominal prefix for first or second plural is realized as a- in Sora.

[16] The enclisis of the SUBJ marker to the PHB particle (or NEG particles in general) in Kharia may be a very old feature, or may reflect contact with North Munda at a more recent date.

[17] Thus, negative forms of PGRG apparently used affixes in meanings differing from their meaning in the positive. NM lacks parallels, so the question is probably whether this is an innovation in PGRG or goes back to the PSM level, lost in the other two daughters PKJ and PSJG. It is possible, if not likely, that the presence of past tense markers in the semantically non-past prohibitive triggered a re-analysis of all NEG forms during the history of PGR(G), further extended during the history of Gutob itself. Note that the more marked positive inflectional categories do not show this shift to a different marker in the negative in Gutob, e.g. *ser-e* ['sing'-OPT] 'may s/he sing' vs. *ar-ser-e* [NEG-'sing'-OPT] 'may s/he not sing'.

[18] Note that Hill Remo perfective forms might etymologically consist of a PAST and NPAST morphemes (or a PAST and an aspectual affix of some type) in the same word, but in a different order than the NEG.PAST.II.

[19] Note *Ṇ-á-coŋ-ke* [1-NEG-'eat'-ke] 'I didn't eat' vs. *na-cóŋ-ke* [2-'eat'-ke] 'you eat'.

[20] This excludes derivational (nominalizing) processes like *-n-* infixation found in both Munda and Mon-Khmer languages.

References

Anderson, G. D. S. 1995-ms. Towards the Proto-North Munda Verb System. Unpublished ms.: Chicago.

Aze, (F.) R. 1973. Clause Patterns in Parengi-Gorum. In R. L. Trail (ed.) *Patterns in clause, sentence, discourse in selected languages of India and Nepal* 1: 235-312.

Banker, E. 1964. Bahnar Affixation. *Mon-Khmer Studies I*: 99-118.

Bhattacharya, S. 1968. *A Bonda Dictionary*. Poona: Deccan College.

Biligiri, H. S. 1965a. *Kharia: Phonology, grammar, vocabulary*. Poona: Deccan College.

_____ 1965b. The Sora verb, a restricted study. In G.B. Milner and E. J. A. Henderson (eds.) *Indo-Pacific Linguistic Studies, II*: 231-250. Amsterdam: North-Holland Publishing Company.

Carey, I. 1961. *Tengleq kui serok: A study of the Temiar language with an ethnographical summary.* Kuala Lumpur.

Costello, N. 1966. Affixes in Katu. *Mon-Khmer Studies II:* 63-86.

Das Gupta, D. 1978. *Linguistic Studies in Juang, Kharia Thar, Lodha, Mal-Pahariya, Ghatoali, Pahariya.* Anthropological Survey of India, Calcutta, 1-90.

Dryer, M. 1986. Primary Objects, Secondary Objects, and Antidative. *Language* 62.4: 808-45.

Fernandez, F. 1968. *A grammatical sketch of Remo: A Munda language.* University of North Carolina Ph.D. dissertation.

_____ 1983. The morphology of the Remo (Bonda) verb. *International Journal of Dravidian Linguistics* 12/1: 15-45.

Hook, P. E. 1991. The compound verb in Munda: An areal overview. *Language Sciences* 13.2: 181-95.

Jenner, P. N., L. C. Thompson and S. Starosta. 1976. *Austroasiatic Studies II.* Oceanic Linguistics Special Publication No. 13. Honolulu: University of Hawaii.

Kullu, P. 1981. *Kharia Vyakaraṇa.* (In Hindi). Ranchi.

Mahapatra. B. P. 1976. Comparative notes on Juang and Kharia finite verbs. In Jenner, P.N., et al (eds.) *Austroasiatic Studies II:* 801-14. Honolulu: University of Hawaii.

Mahapatra, B. and D. Matson. 1962-ms. Brief Description of Juang. Unpublished-ms.: Puri.

Mahapatra, K. (with Dobek Pujari and P. K. Panda). 1989. *Ḍiḍayi* (In Oriya). Academy of Tribal Dialects and Culture, Government of Orissa, Bhubaneshwar.

Malhotra, V. 1982. *The structure of Kharia: A study in linguistic typology and change.* J Nehru Univ. PhD dissertation.

Matson, D. 1964. *A grammatical sketch of Juang.* University of Wisconsin Ph.D. dissertation.

Pinnow, H-J. 1960-ms. *Beiträge zur Kenntnis der Juang-Sprache.* Unpublished-ms. Berlin.

_____ 1966. A comparative study of the verb in the Munda languages. In N. Zide (ed.) *Studies in Comparative Austroasiatic Linguistics,* 96-193. The Hague: Mouton.

Ramamurti, G. V. 1931. *A manual of the So:ra language.* Madras: Govt. Press.

Sadock, J. 1991. *Autolexical Syntax.* Chicago: UC Press.

Starosta, S. 1967. *Sora syntax: A generative approach to a Munda language.* University of Wisconsin PhD dissertation.

Wallace, J. M. 1966. Katu Pronouns. *Mon-Khmer Studies II:* 19-28.

Watson, S. K. 1964. Personal Pronouns in Pocoh. *Mon-Khmer Studies I:* 81-98.

Zide, A. 1983. The Story of Two Girls (excerpt from a Juray text). *International Journal of Dravidian Linguistics* 12/1: 109-11

_____. n. d. Field notes on Gorum. Munda Language Project, Chicago.

_____. 1997. Gutob pronominal clitics and related phenomena elsewhere in Gutob-Remo-Gtaʔ. In A. Abbi (ed.) *Languages of Tribal and Indigenous Peoples of India*, 307-34. Delhi: Montilal Banarsidass.

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