

FEATURE SHUFFLING IN SOUTHEAST ASIAN LANGUAGES

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The present paper is a modified version of one read to the Sino-Tibetan Conference held in San Francisco in 1975, in response to observations made by James Matisoff, in his contribution to Larry Hyman's Consonant Types and Tone. "There is something", Matisoff wrote, "about the tightly structured nature of the syllable in monosyllabic languages which favours the shift in contrastive function from one phonological feature of the syllable to another". And again: "When we look at the phonological changes which these richly complex syllables have undergone through time ... we find that the different parts of the syllable have constantly been influencing each other". And yet again: "So tightly inter-dependent are these neighbouring vowels and consonants that certain phonetic features seem to have bounced back and forth from vowel to consonant and back again through the history of the Tibeto-Burman languages". As a striking example of this, Matisoff cites the curious Burmese case noted at (1):

(1) *ik → Written Burmese ac → Modern Spoken Burmese [iʔ].

Here, if written Burmese can be assumed to represent some sort of attempt at a phonetic representation of the pronunciation of Burmese

some centuries ago, it seems that the frontness of the original Tibeto-Burman vowel fronted the following velar stop while at the same time, apparently, the backness of the original stop retracted the original front vowel. Modern Spoken Burmese, however, bears witness to a subsequent reversal of this process, arriving at the status quo ante, before the eventual merging of final stops in [ʔ].

This curious picture of features apparently 'bouncing back and forth', discussed by Matisoff in a historical perspective, reminded me of somewhat similar synchronic processes that may be observed, either as dialectal variation or as free variation within a single dialect, in the S.E. Asian area. It seemed to me that the popular phonological models of the time, with their preoccupation with segment-based matrices of features, and their anxiety to avoid "redundancy" in the statement of such features, did not provide a convincing or even an adequate framework of description for such processes. The importance of the delicate balance of timing between the articulatory movements of an utterance was largely neglected, and it was the aim of my 1975 paper to suggest that something more flexible than the current segment-by-segment approach was needed to make sense of cases such as that cited by Matisoff for Burmese.

The concept of "panchronic phonology" as presented three years later by André Haudricourt and his distinguished colleague takes full account of the importance of "synchronisation" and "désynchronisation" processes in the history of languages, and it is for this reason that it has seemed worthwhile to take a second look at some of the material in the earlier paper.

If we look at the examples of free variation in Bwe Karen at (2) below

- | | | | |
|-----|-----|---|-------------|
| (2) | (a) | Ru ² ~ wi ² | 'snake' |
| | (b) | lwi ³ ~ lwi ¹ ~ lu ¹ | 'four' |
| | (c) | khwi ¹ ~ khu ¹ | 'nine' |
| | (d) | bwe ¹ ~ bo ¹ | 'how many?' |
| | (e) | thwi ² ~ chu ² | 'dog' |

it seems clear that in these instances the relevant unit for the understanding of such variation is the syllable rather than the 'segment' as usually thought of, and that within the syllable itself we are concerned with syllable parts whose boundaries do not necessarily coincide with those of 'segments'. The important point is to recognize that if we allow ourselves to be too rigidly bound by a phonological theory which demands a strictly segment-by-segment approach, let alone a theory which wants to dispense with syllables altogether, we are liable to miss a number of insights both synchronic and diachronic. Most phonologists are so accustomed now-a-days to think that 'segments' must be 'roman

letter sized' - (surely an example of linguistic chauvinism?)

- and that features must be attached to such segments, that when we hear of 'features bouncing back and forth' we immediately think in terms of changes or exchanges in the feature matrices of segments, and are disposed to formulate our phonological rules accordingly. With a certain amount of ingenuity at times, this can usually be done, but whether the resulting rules are the most illuminating way of looking at the data is quite another matter.

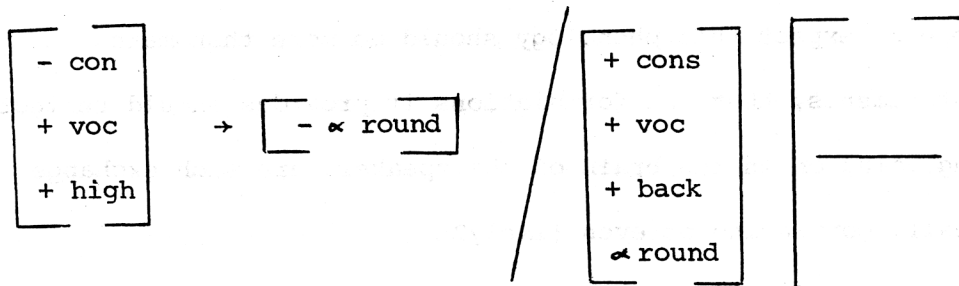
For many languages it may be helpful at times to think of certain of the phonological features of syllables as being dealt out in 'hands' of 'playing cards', so to speak, to the syllable as a whole rather than as firmly attached to any one segment in it, or even to any one place. Obviously, the phonetic realisation takes place in time, and in sequence of some sort, but even here the temporal distribution of features may be far less important from the point of view of 'distinctiveness' than for most Western languages. In the Burmese example already cited, the presence of both what one may call 'Frontness' and 'Backness' have always been present; what appears to have changed from time to time is their temporal distribution over the canonical VC structure of the rhyme. We could try to formulate this in terms of some kind of feature metathesis or 'flip-flop', some kind of α -reversal rule, like the 'exchange

rules' in SPE. This may result in a neat formal statement, but if we hope or expect that phonology should do more than make formal statements, that the formulations it provides should reflect something going on in the brain of the speaker, are such exchange rules really convincing or even likely?

The forms Ru² and wi² 'snake' at 2(a) are in free variation in the speech of the informants I worked with. [What is represented by the uvular [R] symbol is in fact the 'missing' semivowel or glide, i.e. the back unrounded glide for which the International Phonetic Alphabet has only very recently suggested a specific symbol.] The canonical form of syllables (and most morphemes) in Bwe is CV. In this word the C is further specified as a back glide, and the vowel as high. Granted that, one can see that the 'cards' dealt to the syllable as a whole include rounding or labiality, and spreading. I prefer myself not automatically to think in terms of plus-or-minus any specific feature, as this often tends to prejudge the issue, but in this particular case it works out quite neatly if one uses plus-or-minus round:

Ru ²			wi ²	
+ cons	- cons	~	+ cons	-cons
+ voc	+ voc		+ voc	+voc
+ back	+ high		+ back	+high
- round	+ round		+ round	-round

Here, one could clearly have some such rule as

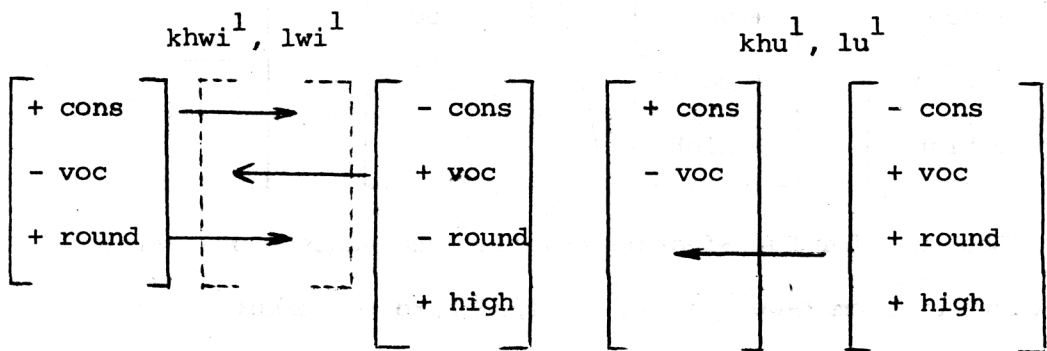


It is a little less easy to handle 2(b), (c) and (d) segmentally:

lwi ³ ~ lwi ¹ ~ lu ¹	'four'
khwi ¹ ~ khu ¹	'nine'
bwe ¹ ~ bo ¹	'how many?'

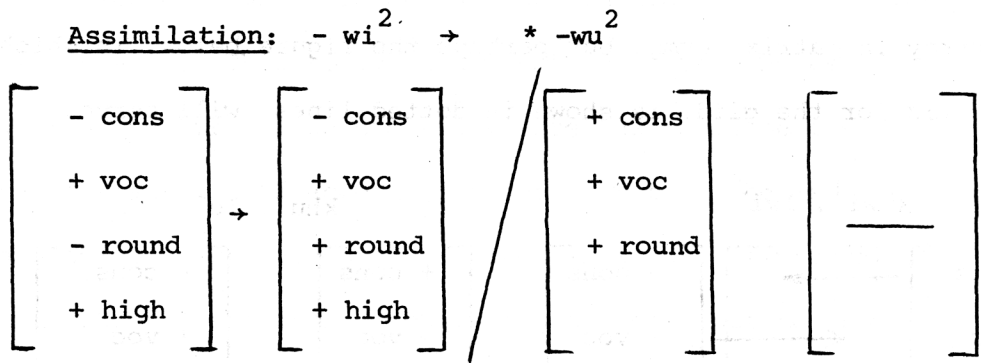
One would presumably need to have an ordered set of rules whereby the following i or e is rounded and backed by the w, which is then deleted. This to my mind might be convincing as a diachronic explanation, if all we had today were the forms on the right, but it does not adequately account for the fact that the left and right hand columns are currently in free variation. I prefer once again to think of the feature 'roundness' as dealt out to the syllable, rather than to specific segments. The difference between the two forms is then seen to be one of temporal distribution or phasing. In lwi¹, khwi¹, bwe¹, rounding begins at the beginning of the syllable, carries on through the beginning of the vocalic phase (i.e. the 'glide') and then fades out before the end of the vocalic

phase, whereas in lu¹, khu¹, etc. it carries on through the whole syllable. (Note that it would be incorrect to mark the phonetic matrix of the l, kh or b segments as [- round], though I suspect that this is what might happen in a conventional segmental statement.) In fact we are concerned here with degrees of feature spreading: with the 'synchronisation' of features. It is interesting that it is not only the rounding feature that is spread. We could say that the forms with the w-glide differ from those without the glide simply through the phasing or 'spread' of the features consonantal and vocalic. Taking CV as the canonical structure once again, in lwi¹ etc. consonantality has spread to overlap the vocality feature, as contrasted with lu¹, khu¹ etc. where there is no such overlap. This is difficult to portray in matrix terms, but perhaps the figure below, in which the matrix for the glide is shown in dotted lines, will serve:



The example thwi² ~ chu² 'dog' at 2(e) is more difficult to handle segmentally as we have here a further example of the apparently simultaneous interaction of the two parts of the syllable, as in (1). It would be interesting to see an attempt at "ordered rules" here. We have to account both for the rounding of the vowel and for the palatalisation of the consonant in chu², as contrasted with the spread vowel and nonpalatalised consonant of thwi².

We could perhaps postulate an 'assimilation' rule, whereby thwi² → *thwu², and thereafter an 'equi-feature deletion' rule, resulting in a coalescence of segments, carrying us from *thwu² to thu², viz:



The rule for Equi-feature deletion and subsequent coalescence to carry us from *-wu² → -u² I find hard to formulate, but I concede that those expert in this particular kind of phonology would probably do so without difficulty.

A more serious problem is that thwi² 'dog' is not in free variation with thu², which means 'to pick up' or 'quicklime'. How then do we get from *thu² to chu²? We cannot apply a 'fronting assimilation' rule since we now have only a back vowel to deal with. Even if we do not try to apply ordered segmental rules there is some difficulty in regarding ch as palatalised through the assimilation of th- to a following high front vowel, since there is an intervening back glide, which might have been expected to block such a process. We have here another striking example of the inter-dependence of syllable parts and of the relative temporal freedom of syllable features to spread over these parts to a greater or lesser extent without change of meaning.

An objection that may be raised is that by no means all Bwe words with a w glide and a spread vowel are in free variation with words with a rounded vowel but no glide. Why not? I suspect that sometimes there may be cross-dialectal influences at work here, especially in the numerals; my principal informant spoke Sgaw Karen as well as his native Bwe. Be that as it may: whether the variation is infra- or inter-dialectal, a viewpoint which allows one to take account of the mutual timing of the syllable features rather than an exclusively segmental approach to them, is able to highlight the basic underlying 'sameness' of such variant forms.

Further challenging examples of free variation in Bwe are shown at (3) below, but will not be dealt with further here:

- (3) (a) ru³ ~ we³ 'to smelt'
(b) Re³ ~ we³ 'to tackle'
(c) Ro³ ~ ro³ 'to poke'
(d) Ro² ~ ho² 'to clear (taungya)'
(e) Ro² ~ ho² 'morning, early'

Lest it should be thought that Bwe Karen is exceptional in the matter of 'feature shuffling', the examples at (4) show similar processes in Songkhla, a Southern Thai dialect. (4) (a) and (b) show free variation between initial khw- and f-, and between initial kh- and f- before a rounded vowel.

- (4) (a) \fai ~ \khwai 'fire'
(b) 'fon ~ 'khon 'rain'

Here the clue is the phonetic observation (often missed) of the prevalent velarisation of f's in Thai. The hand dealt out to the first part of the syllables at (a) and (b) consists of features that may loosely be labelled velarity, voicelessness, labiality (not rounding, though phonetically some degree of rounding runs through the khw of 'khwai and through part of the kh of 'khon and f of 'fon, but not through the f of 'fai), and some term such as

aspiration or spirantisation or perhaps delayed Voice Onset Time

if you prefer, to describe the common properties of voiceless aspirated plosives and fricatives, which so often form a 'natural class' in this area. Once again, it is a question of timing; in performance the spread of a feature is not necessarily confined to a single segment. What is important is its presence in the initial part of the syllable. In khwai, the features are disposed thus:-

khw-

velarity

velarity

voicelessness

voicelessness

aspiration/spirantisation

labiality

Note that velarity and voicelessness run through both segments. The spread of voicelessness could not, as might perhaps be expected, be predicted by an assimilation rule linked to the voicelessness in the preceding segment, since after unaspirated plosives glides are voiced. The link is with the aspiration/spirantisation value.

In fai we have in the initial consonant a sort of shuffling together or coalescence of the same features present in the khw of khwai, with no 'spreading', thus:-

f-

velarity

voicelessness

labiality

aspiration/spirantisation

There is also free variation in some words in Songkhla between θ and kl-, as in:-

(4) (c) -θuət ~ -kluət 'to examine'

(d) θɔ:ŋ ~ klɔ:ŋ 'to filter'

This is trickier than the khw ~ f variation, but less so if one remembers that θ in S.E. Asia (cp. Burmese, Central Chin) is often not pronounced as a fricative with air escaping between the tongue and the front teeth as, following English, is often assumed, but rather as a pretty tense interdental stop with air escaping laterally. The sequence of stop and lateral, as in kl, is thus not so far removed from a θ pronounced as a stop with simultaneous lateral escape of air, especially if one assumes the likelihood of a variation at some stage between tl- and kl-. This at least suggests a possible alternative to explanations seeking to derive such forms from *skl- clusters and the like. The historical derivation of a cluster need not always be another, frequently more complex, cluster; clusters may sometimes be instances of the

temporal separation of features, just as simple consonants may be the outcome of a coalescence of features once temporally separated.

The example below at 4(e) gives a single instance (it may not be the only one in the language) of variation between θ ~ kl ~ tɕ,

(4) (e) θuət ~ kluət ~ tɕuət 'a kind of fish';
i.e. between what is usually thought of as a voiceless fricative, a stop + lateral cluster, and an affricate. This at first sight unlikely association recalls the development of stop + lateral clusters in Vietnamese (see (5) (a) and (b)), where 17th century Tonkinese bl- and tl- are pronounced [tɕ] or [z] in Modern Northern Vietnamese, [tɕ] and [j] in the South. The modern spellings with tr- and gi- suggest the stages whereby this may have come about:

	<u>Tonkinese</u> (C17)	<u>Written Vietnamese</u>	<u>Spoken Vietnamese</u>	
			<u>Northern</u>	<u>Southern</u>
(5) (a) 'moon'	blang	trăng, giăng	[-tɕaŋ, -zaŋ]	[-tɕaŋ, -jaŋ]
(b) 'sky'	blời	trời, giời,	[,tɕvi, ,zvi]	[,tɕvi, ,jvi]

Plosive + liquid clusters, affricates and fricatives are here seen to be historically and dialectally linked, so that the Songkhla examples need cause no great surprise.

Nasalisation is another feature which may sometimes profitably be regarded as pertaining to the syllable or to parts of syllables, rather than as confined to a segment matrix. It is once more a matter of timing; timing in this case of the raising or lowering of the soft palate. In fact, one might think in terms of points along a time scale for Velum Raising Time (VRT) in parallel with Lisker and Abramson's Voice Onset Time (VOT). One can apply this notion to the examples at (6):

- (6) Songkhla: ʰũ 'ear', ʰũ̃ 'snake'
Central Thai: ʰu 'ear', -ŋu 'snake'

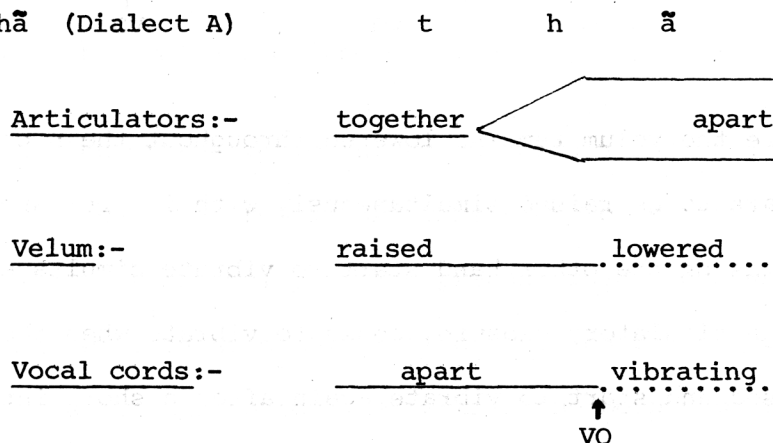
I almost always hear fairly marked nasalisation of at least the first part of the vowel in Central Thai ʰu 'ear', I am not so conscious of nasalisation of the vowel in -ŋu 'snake', but laboratory experiments indicate that some is present. It is assumed that there is in both words some delay in the raising of the velum from its lowered position of rest. Such delay in VRT is of course an essential element in all nasal consonants, and is apparently also a feature of initial h in some kinds of Thai. Laboratory investigation of the two Songkhla words for 'ear' and 'snake' shows a little burst of nasal vibration at the beginning of ʰũ 'ear', and a prolonged period of much stronger nasal vibration throughout the utterance of ʰũ̃ 'snake'. To the listener it sounds as if the vowel of the first word is slightly nasalised while that

Where in a segmental matrix presentation, would one in such instances locate the feature '+ nasal'? In neither segment in the first, and both in the second? Or in the first segment only of the second word, so as to be able to link it easily with the Central Thai cognate? This seems to me to be another case where to be forced to take a decision on a plus-or-minus basis, segment by segment, tends to obscure rather than to illumine the phonological processes at work.

Yao, as spoken by some speakers I was able to listen to on a visit to Northern Thailand, furnishes further interesting examples involving nasalisation. The speakers of Dialect A pronounced the word for 'bow' as [-thã], with an aspirated t followed by a lightly nasalised vowel. The speaker of Dialect B did not recognise this form of the word, however. His word for 'bow' was something I can only transcribe as [-n^ha], with a very short initial dental nasal followed by a very light aspiration, followed in turn by a vowel which to my ears did not sound nasalised. He firmly rejected pronunciations with a voiceless n, e.g. [*na] (which is what I would ordinarily expect a transcription [n^ha] to mean if I came across it in someone else's work). He also denied knowledge of [-thã] as an isolate, but in the course of conversation produced a compound [-puən⁻thã],

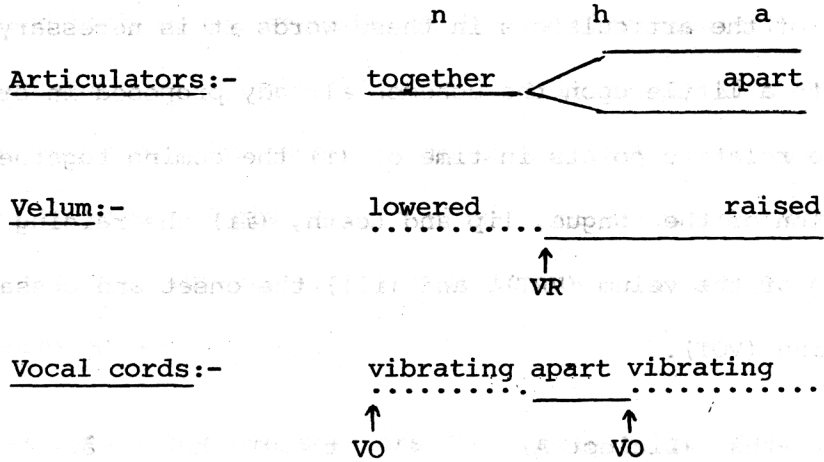
in which the second element was the morpheme 'bow'. To illustrate the phasing of larynx and nasal vibration with the contact and release of the articulators in these words it is necessary to elaborate a little upon the schemes already proposed in order to show the relative points in time of (i) the coming together and separation of the tongue, lip and teeth, (ii) the raising and lowering of the velum (VRT), and (iii) the onset and cessation of voicing (VOT).

Fig. 3 -thā̃ (Dialect A)



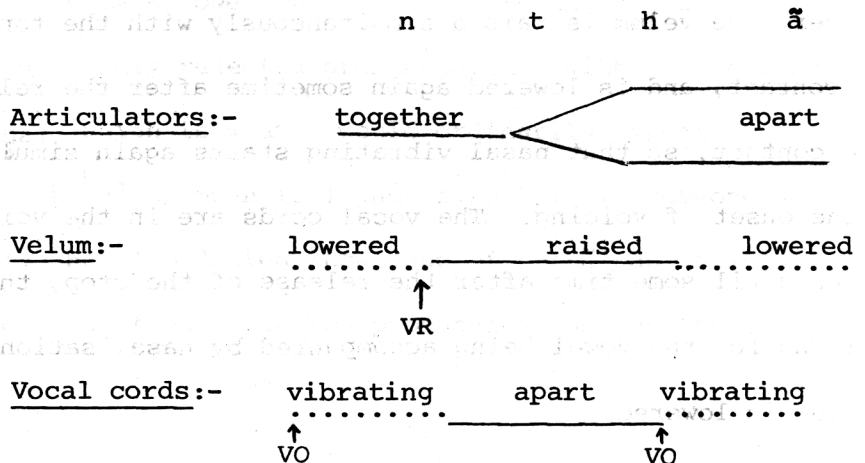
Here the velum is raised simultaneously with the tongue-teeth contact, and is lowered again sometime after the release of the contact, so that nasal vibrating starts again simultaneously with the onset of voicing. The vocal cords are in the voiceless position until some time after the release of the stop, the onset of voicing for the vowel being accompanied by nasalisation as the velum is lowered.

Fig. 4 -n^ha (Dialect B)



Here the velum remains lowered throughout the n contact, but appears to be raised simultaneously with its release. The vocal cords on the other hand start to vibrate simultaneously with the articulatory closure, cease to vibrate when the closure is released and start to vibrate again after a short interval.

Fig. 5 --n^hthã (in -puen^hthã, Dialect B)



In the middle of this compound we find the velum which has been raised for the preceding vowel, is lowered with the coming together of the articulators but raised again before they are released. Velum lowering takes place again a short time after the release of the articulators, to coincide with the onset of voicing. The vocal cords which have been vibrating for the preceding vowel, continue to vibrate for the part of the closure during which the velum is lowered, but cease to vibrate when it is raised again. Voicing does not start again until a short interval after the release of the closure.

The phasing of the velum and vocal cords relative to the articulatory closure and release in this example is characteristic of that of what are generally called prenasalised stops when found initially. It will be seen that neither the feature 'voice' nor the feature 'nasal' can be confined within the bounds of any given segment without seriously distorting our picture of the delicate temporal relationships between the three Yao forms.

In the short time I was able to work with Yao, there were other instances where the variation between forms appeared to correlate with the timing of the raising of the velum and to be as far as I could tell a matter of performance only:

e.g. Dialect A Dialect B
 -^hpiẽn ~ miẽn -^hm^hian 'face'

Readers will themselves be able to draw up VRT and VOT phasing diagrams for these forms.

The last language I wish to look at briefly here is Vietnamese, whose phonology presents certain well-known and well-worked problems. Anyone who has struggled with the proliferation of centralized vowels in Southern Vietnamese and with the distribution of final consonants in both the Northern and Southern dialects, will be familiar already with these problems.

In Northern Vietnamese words spelt with final -ch there is a polarity problem again, as in the Burmese example we started with. Final velars appear to have been fronted after front vowels, while front vowels have been centralised before final velars! It is impossible to say which is the cart and which the horse in such cases. In Southern Vietnamese the fronting of the velar appears to have carried it all the way to merge with final -t, while there has also been marked centralisation of the vowel itself; only before labials do we get a clear and unmistakable front vowel. It is not so much a question of feature reversal as of features spreading simultaneously in opposite directions.

This reshuffling of features is also very noticeable in both dialects in syllables written with rounded vowels before a final velar: -ong, -ong. Here we find strong labialisation of the velar itself, while the 'rounded' vowel is pronounced as a diphthong, beginning with an unrounded vowel, viz [əuŋ̹m, auŋ̹m]. It is as if the roundness has slipped from the beginning of the syllable towards the end, while the back but non-round quality we expect of a velar consonant is perhaps reflected in the onset of the diphthong. It has further confused investigators that loanwords are pronounced [o.ŋ] or [ɔ.ŋ] without this re-phasing of features. The same elements are present in both native and borrowed words, but timed differently in utterances. The linguist has to decide whether to assign a different phonological shape to such variations, or to handle them in terms of two different sets of performance rules, one for native and one for foreign words. The tendency has been to choose the first solution, which is the easy option, but not necessarily the most 'insightful' from a panchronic point of view.

REFERENCES

- Chantavibulya, V. (1959). The Phonology of the Syllable in Songkhla, a Southern Thai dialect. Unpublished London M.A. Thesis.
- Hagège, C. and Haudricourt, A. (1978). La phonologie panchronique, Presses Universitaires de France, Paris.
- Ladefoged, P. (1975). A Course in Phonetics, Harcourt Brace Jovanovich, New York.
- Lisker, L. and Abramson, A.S. (1964). "A cross-language study of voicing in initial stops: acoustical measurement", Word, 20.
- Matisoff, J. (1973). "Tonogenesis in Southeast Asia", in Hyman, L. (Ed.) Consonant Types and Tone.
- Rhodes, Alexandre de (1651). Dictionarium Annamiticum, Lusitanum et Latinum, Rome.