INFIXATION AND APOPHONY IN MALAY: DESCRIPTION AND DEVELOPMENTAL STAGES

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Abstract

Malay(ic) languages of Sumatra show a high level of internal diversity. Linguists are only beginning to understand the ways in which these languages differ from one another, and what this divergence tells us about the origins and development of Malay. This paper describes an important morphological phenomenon in Sumatran Malay: morphological word-shape alternations. Kerinci, a Malayic language spoken in the Bukit Barisan range in Jambi, exemplifies this phenomenon. Kerinci exhibits a morphological alternation which is realized in the final –V(C) of roots (e.g. ataʔ 'roof' vs. atǝk 'the/its roof') (Prentice & Usman, 1978; Steinhauer & Usman, 1978) inter alia). Previous studies have concluded that word-shape alternations of this sort are attested only in a subregion of Kerinci (cf. Usman, 1988). In this paper, we show that word-shape alternations resembling those found in Kerinci can be found sporadically throughout a large region of Sumatra, in both Minangkabau and Traditional Malay varieties. We describe these phenomena, and develop a historical account of their development. We conclude that word-shape alternations developed independently in several varieties as a result of shared prosodic properties.

Keywords: *infixation, Malay, historical linguistics*

Abstrak

Bahasa-bahasa Malayik di Sumatra memiliki keanekaragaman internal yang tinggi. Para ahli bahasa baru saja mulai mengerti bagaimana bahasa-bahasa ini berbeda satu sama lain dan bagaimana perbedaan ini menunjukkan asal-usul dan perkembangan bahasa Melayu. Makalah ini mendeskripsikan sebuah gejala morfologis penting yang ditemukan dalam bahasa Melayu di Sumatra, yaitu perubahan bentuk kata morfologis. Bahasa Kerinci, sebuah bahasa Malayik yang digunakan di Bukit Barisan Jambi, merupakan salah satu bahasa yang menunjukkan gejala morfologis tersebut. Bahasa Kerinci memiliki perubahan morfologis yang diwujudkan dalam kata dasar yang

berakhiran –V(K) (misalnya, *ataʔ* 'atap' vs. *atək* 'atap itu/atapnya') (antara lain: Prentice & Usman, 1978; Steinhauer & Usman, 1978). Dalam kajian-kajian sebelumnya disimpulkan bahwa perubahan bentuk seperti ini hanya ditemukan di daerah Kerinci (Usman, 1988). Dalam makalah ini kami tunjukkan bahwa perubahan-perubahan bentuk kata seperti yang ditemukan di Kerinci itu juga ditemukan secara sporadis di daerah yang besar di Sumatra, yaitu dalam ragam-ragam bahasa Minangkabau dan Melayu Tradisional. Kami gambarkan gejala-gejala tersebut dan paparkan sebuah penjelasan historis mengenai bagaimana gejala-gejala tersebut dapat terjadi. Kami simpulkan bahwa perubahan-perubahan bentuk kata berkembang sendiri-sendiri dalam beberapa ragam bahasa sebagai hasil dari sifat prosodik yang sama.

Kata kunci: *infiksasi, Melayu, linguistik historis*

INTRODUCTION

Among the Malayic languages, Kerinci is well-known for its unusual morphological characteristics. In many (but not all) Kerinci varieties, roots show apophony of the root-final syllable rime. The following table, which lists several 'basic' forms and their respective 'secondary' forms, illustrates some of the phonological properties of the alternation as well as its diverse morphological/syntactic functions. (An in-depth description of these functions can be found in works like Steinhauer & Usman, 1978, Usman, 1988, Mckinnon, 2011, McKinnon, Cole & Hermon, 2011, and Ernanda, 2015).

(1) Kerinci (Tanjung Pauh) root final alternation[1]

Basic Form	Gloss	Secondary Form	Gloss
gdɨ	'large'	gdʌŋ	'enlarge' or 'largeness of (something)'
talā͡e	'rope'	talɨy	'his/her/the rope'
mala	'night'	maləŋ	'last night'
anaʔ	'child'	anɔ͡oʔ	'his/her/the child'
mandā͡e	'bathe'	mandɨy	'to bathe (someone)'
tidɔ͡o	'sleep'	tidɨw	'to put (someone) to sleep'

Until recently, word-shape alternations have been seen as a peculiarity, restricted to certain Kerinci varieties, but otherwise not found in Malayic languages. Our recent fieldwork in the region has revealed that morphological alternations like those found in Kerinci are also found in several rural Malay varieties spoken well outside of Kerinci. One such variety is Rantau Panjang, a Traditional Malayic variety spoken in upstream Jambi. As the following examples illustrate, the final syllable rime of roots in Rantau Panjang exhibits a morphological alternation.

(2) Rantau Panjang root final alternation

Basic form	Gloss	Secondary Form	Gloss
gaham	'salt'	gahom	'his/her/the salt'
anaʔ	'child'	anoʔ	'his/her/the child'
ilaŋ	'disappear'	ŋiloŋ	'to make something disappear'
bulant	'round'	bulont	'to make something round'
api	'fire'	apih	'the fire'
baco	'read'	bacuh	'to read something'

Although there are similarities between the word-shape alternations in Kerinci varieties and those found in non-Kerinci varieties, there are also important differences. Mckinnon *et. al.*

(under review) distinguish two general types of alternating varieties based on the grammatical distribution of 'basic' and 'secondary' forms. In so-called 'weakly' alternating varieties (which include non-Kerinci varieties as well as some Kerinci varieties, such as Lempur) secondary forms have limited functions, and only appear in environments where a 3rd person pronoun or suffix is attested in other varieties. The following examples show secondary forms and their cognates in a non-alternating variety (e.g. Jambi Malay).

(3) Ablaut in Rantau Panjang (RP) and Overt Pronoun in Jambi Malay (JM)

| RP (Secondary Form)	JM (Overt Pronoun)	Meaning
gahom	garam-ɲo	'his/her/the salt'
anoʔ	anaʔ-ɲo	'his/her/the child'
apih	api-ɲo	'the fire'

(4) Ablaut in Rantau Panjang (RP) and Overt Suffix in Jambi Malay (JM)

RP (Secondary Form)	JM (Overt Suffix)	Meaning
pcoh	mcah-i	'to break something'
ŋiloŋ	ŋilaŋ-kan	'to make something disappear'
ŋatun	ŋato-kan	'to say'

In strongly alternating varieties secondary forms do not only exhibit the functions shown in (3) and (4), they also appear in certain phrase-medial contexts. For example, nouns appear in the secondary form when followed by possessors (5), attributive adjectives (6), and demonstratives (7), and active verbs appear in the secondary form when followed by a nominal direct object (8). In weakly alternating varieties, the basic root form appears in these phrase-medial contexts.

(5)
Kerinci (Secondary form)	RP (Basic form)	Meaning
mamə͡oʔ kantə͡e	mamaʔ kanti	'a friend's uncle'

(6)
Kerinci (Secondary form)	RP (Basic form)	Meaning
talɨy panǰa	tali panǰaŋ	'long rope'

(7)
Kerinci (Secondary form)	RP (Basic form)	Meaning
bidɨwʔ itə͡oh	bidʊʔ-tu	'that boat'
m^yə͡o tah	macan-tu	'that tiger'

(8)
Kerinci (Secondary from)	RP (Basic form)	Meaning
makən rutɨy	makan/*makon ruti	'eat bread'
	maŋ^gaŋ/*maŋ^goŋ ayam	'grill chicken'

In terms of their geographic distribution, strongly alternating varieties are spoken in a small yet contiguous sub-region of Kerinci, whereas weakly alternating varieties are spoken throughout a much larger region, and are interspersed with varieties that do not exhibit an alternation.
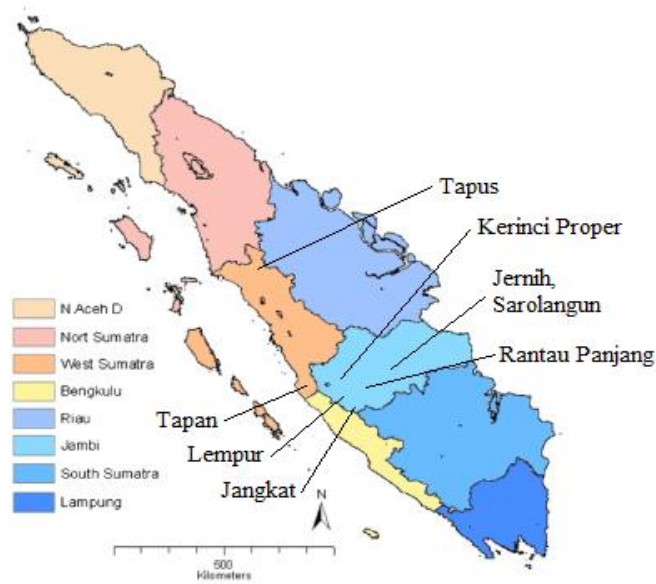
The aims of this paper are to describe the properties of apophony in so-called weakly alternating varieties and to provide an account of how this alternation developed historically. We shall argue that morphological apophony developed independently in several varieties, and that its development can be seen as a consequence of prosodic characteristics shared by Malayic varieties spoken throughout the region. Specifically, we claim that secondary forms derive historically from forms in which prosodically weak pronouns and suffixes underwent gradual phonological reduction.

In this paper we focus exclusively on weakly alternating varieties for several reasons: First, weakly alternating varieties have not yet been described in any detail. Secondly, weakly alternating varieties are quite conservative in terms of their phonology. Thus, from these varieties, we can reliably infer which historical changes have led to the development of the alternation. In contrast, strongly alternating varieties have undergone complex historical changes that obscure the historical origins of morphological apophony. Thirdly, we wish to avoid addressing the historical relationship among weakly and strongly alternating varieties, because this issue is addressed comprehensively in Mckinnon, Cole, Hermon, and Yanti (under review). The present paper provides an in-depth description of weakly alternating varieties, which, due to limitations of length and scope, could not be addressed in Mckinnon, *et al.* (under review).

STRUCTURE OF THE PAPER

The paper is structured as follows: The next three sections of this paper describe the phonological properties of apophony in weakly alternating varieties. Our general claim is that morphological apophony developed as a result of phonological reduction of post-root morphology (e.g. suffixes and the 3rd person pronoun). Accordingly, we classify varieties based on the degree to which post-root morphemes have become phonologically reduced. Weakly alternating varieties can be described as belonging to three distinct groups, representing three progressive historical stages, i.e. stages II, III, and IV below.

I.   Original Stage: Post-root pronoun/suffix occurs as a separate syllable.
II. Reduced Stage: Post-root pronoun/suffix is highly reduced and appears as part of the root-final coda with some or all of the bases to which it attaches.
III. Infixation Stage: Post-root pronoun/suffix becomes an infix appearing in the final syllable of the word.
IV. Morphologically Incorporated Stage: Post-root pronoun/suffix is no longer a distinct morpheme; rather, it is marked via a morphophonological change in the base-final syllable.

These historical stages can be illustrated in brief by looking at the form of *makan* 'eat' as it appears with the 3rd person pronoun. Jambi Malay (Yanti, 2010) represents stage I. The pronoun occupies a distinct syllable following the root.

(9) Jambi Malay:
    makan-ɲo
       | |
     base   pro

Stage II is illustrated by Tapus, a variety of Minangkabau spoken near the northern border of West Sumatra. In this variety, the pronoun occurs in a phonologically reduced form. The pronoun appears at the right edge of the base *makan,* and receives some of its feature specifications from the coda of the base.

(10) Tapus Minangkabau:
    makan-n   [makan:]
       | |
     base   pro

Stage III is illustrated by Jernih Sarolangun, a variety spoken in the Air Hitam region of Sarolangun, Jambi. In this variety, the pronoun has become a phonological infix i.e. the pronoun, which historically was a suffix, precedes the final coda and exhibits some assimilation to the preceding vowel. In Jernih Sarolangun, the infixed vowel assimilates to the final syllable nucleus of the base *makan* (pronounced as *makat* or *makat^n* in phrase-final positions (see Mckinnon *et. al.*)).

(11) Jernih Sarolangun
         Base
         / \
     maka-a-n
           |
          pro

Stage IV is illustrated by Rantau Panjang, a variety of Malay spoken in upstream Jambi to the north of Bangko on the Trans-Sumatran Highway. In Rantau Panjang, the pronoun morpheme is no longer retained as a distinct segment; instead, the pronominal function is marked via a morphophonological rule which affects the final rime of the word. In its secondary form, the final vowel of the root *makan* becomes *o*.

(12) Rantau Panjang
  Basic form Secondary form
  makan > makon

   In the final section of the paper, following our description of varieties belonging to the aforementioned groups, we discuss the historical relationship between weakly alternating varieties. The fact that changes with similar functions occur in a wide variety of languages might seem to suggest that the changes in weakly alternating varieties are all derived from a shared historical innovation in an earlier variety of Malayic. While such an analysis is initially attractive, we shall argue that it is not the correct analysis. This is because the phonological manifestations of the changes are too different in the varieties considered to derive from a shared innovation. Instead, we shall argue that the innovations developed in parallel, and were due to shared phonological pressures (a shared "problem") that received differing solutions in different weakly alternating varieties.

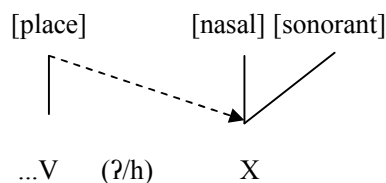## STAGE II: VARIETIES WITH PHONOLOGICALLY REDUCED POST-ROOT MORPHOLOGY

Tapus Minangkabau and Lempur Tengah, Kerinci, both illustrate Stage II, i.e. post-root morphology appears in a phonologically reduced form at the right edge of the root/base.
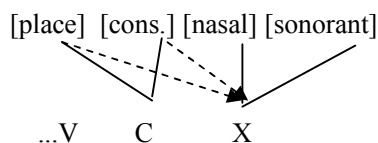
Tapus Minangkabau

Tapus is a variety which illustrates an initial stage in the gradual reduction of root-final morphology. The pronoun in this variety is an underspecified segment exhibiting the features [nasal] and [sonorant], which attaches to the right edge of its base. The [place] (i.e. oral place) and [consonant] (when present) features of this segment are determined via spreading from the final segment of the base.[2]

(13) Spreading in secondary form:
  a. V-final or VɁ/h final bases:

   [place]   [nasal] [sonorant]

   ...V (Ɂ/h) X

  b. VC-final bases:

   [place] [cons.] [nasal] [sonorant]

   ...V C X

Thus, in bases containing a monophthong in final position, the secondary form surfaces with a nasal vowel with the same features as the base final vowel.[3]

(14) Alternation in roots with final monophthong:

-V#	Basic Form	Secondary Form	Malay	English
-i	padi	padiĩ	padi	'rice (unhusked)'
-u	kayu	kayuũ	kayu	'rich'
-o	rajo	rajoõ	raja	'king'
-a	gata	gataã	gatal	'itch'

Glottal segments do not trigger or block feature spreading in the derivation of secondary forms. The following examples all contain glottal codas in final position. As in the examples above, the additional [nasal] segment marking the secondary form exhibits [place] features which are identical to the final vowel in the base.

(15) Alternation in roots with final glottal:

Rime	Basic Form	Secondary Form	Malay	English
-iʔ	gigiʔ	gigiʔĩ	gigit	'to bite'
-eʔ	padeʔ	padeʔẽ	padat	'dense'
-aʔ	togaʔ	togaʔã	təgaʔ	'to stand up'
-oʔ	gonoʔ	gonoʔõ	gənap	'even/whole'
-ih	gadih	gadihĩ	gadis	'girl/virgin'
-eh	joleh	jolehẽ	jəlas	'clear'
-ah	basah	basahã	basah	'wet'

In words containing a diphthong or sequence of vowel and glide in the final coda, the [place] features of the glide spread in the secondary form. In the two data sets below, bases in the first set do not exhibit a final coda; whereas, in the second data set each of the bases contains a glottal coda.

(16) Bases with final diphthongs

Rime	Basic Form	Secondary Form	Malay	English
-iᵃ	bibiᵃ	bibiᵃã	bibir	'lips'
-uᵃ	caŋkuᵃ	caŋkuᵃã	caŋkul	'mattock'
-ay	lantay	lantayĩ	lantay	'floor'
-aw	hijaw	hijawũ	hijaw	'green'

(17) Bases with final diphthong followed by glottal coda

Rime	Basic Form	Secondary Form	Malay	English
-iᵃh	borosiᵃh	brosiᵃhã	bərsih	'clean'
-uᵃʔ	buruᵃʔ	buruᵃʔã	buruk	'ugly'
-uᵃh	subuᵃh	subuᵃhã	subuh	'dawn'
- iᵃʔ	baliᵃʔ	baliᵃʔã	balik	'return'
-uyʔ	cabuyʔ	cabuyʔĩ	cabut	'pull out'

Bases in which the final segment is a nasal stop exhibit secondary forms in which the same nasal segment is realized with noticeably longer duration.

(18) Alternation in roots with final nasal stop:

Rime	Basic Form	Secondary Form	Malay	English
-m	musim	musim:	musim	'season'
-n	diŋin	diŋin:	diŋin	'cold'
-ŋ	kambiᵃŋ	kambiᵃŋ:	kambiŋ	'goat'

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(19) Alternation in roots with final oral stop:

-VC#	Basic Form	Secondary Form	Malay	English
-p	waǰip	waǰipm	wajip	'mandatory'
	titip	titipm	titip	'entrust'
-t	adat	adatn	adat	'customary law'
	dompɛt	dompɛtn	dompet	'wallet'

To summarize, the pronoun is phonologically reduced in Tapus, and 'relies' on the final segments of the root for its featural content.

Lempur Tengah

Post-root morphology is also reduced in Lempur Tengah, and like Tapus, the featural specification of this morphology depends in large part on the phonological properties of the root. With most roots, the third person pronoun is realized as a schwa-like segment with very short duration compared to the root-final syllable (20). However, when the final coda of the root is a glottal sound ([h] or [ʔ]), this schwa-like segment assimilates in place of articulation to the vowel immediately preceding the glottal stop (20).

(20) Lempur Tengah (Kerinci): reduced pronoun/suffix

a. pronoun/suffix realized as schwa

panǰe	'long'	>	panǰeᵊ
tanam	'plant'	>	tanamᵊ
lantay	'floor'	>	lantayᵊ
dɛnʌw	'lake'	>	dɛnʌwᵊ
biçʊl	'boil (skin)'	>	bisʸʊlᵊ

b. pronoun/suffix harmonizes w/final vowel

lmaʔ	'fat/tasty'	>	lmaʔᵃ
tgʌʔ	'stand'	>	tgʌʔᴧ
tpoʔ	'clap/slap'	>	tpoʔᵒ
panah	'arrow'	>	panahᵃ
gɛǰʌh	'elephant'	>	gɛǰʌhᴧ
iblih	'evil spirit'	>	iblihⁱ
naŋeh	'cry'	>	naŋehᵉ
haluyh	'fine'	>	haluyhⁱ
buŋkuyh	'pack'	>	buŋkuyhⁱ
puteh	'white'	>	putehᵉ

Therefore, much as in Tapus, Lempur represents a variety wherein the root-final morphology has undergone phonological reduction. In both varieties, the pronoun is phonologically underspecified, and its surface manifestation is in part determined by the phonological properties of the base to which it attaches (though it reflects the properties of the base in different ways in each case).

STAGE III: VARIETIES WITH INFIXED POST-ROOT MORPHOLOGY

Tapan (West Sumatra) and Jernih, Sarolangun (Jambi), are both representative of Stage III, i.e. the reflexes of post-root morphemes behave as infixes for some (Tapan) or all (Jernih) bases.

Tapan

Tapan is a Malayic variety spoken in the Pesisir region of West Sumatra, near the border with Bengkulu. Gil, Kurniati, Wichmann, and Putri (2011) have argued that Tapan, along with Muko-Muko (Bengkulu) and other varieties spoken in this region is a variety of Lunangic, a divergent branch of Minangic. The variety we describe here is spoken in the village of Binjai. This variety shows different phonological properties from the variety spoken in the Tapan Kota (Tapan City) (Gil & Mckinnon, 2014).

In Tapan, the 3rd person pronoun is phonologically reduced, as in Tapus and Lempur. According to speakers' judgments, this morpheme does not constitute a separate syllable. In contrast with the other varieties, in Tapan the pronoun does not always appear at the right edge of the base to which it attaches. In fact, the position of the pronoun is determined by the properties of the final coda.

For bases containing an open final syllable, [-low] vowels are inglided and [+low] vowels are lengthened.

(21) Tapan: Vowel final bases

    a. Forms ending with a [-low] vowel

       matu > matu[a] 'eye'
       piki   > piki[a]   'think'
       bibe > bibe[a] 'lips'

    b. Forms ending with [+low] vowel

       miǎ   > miǎ: 'table'
       acara > acara: 'event'
       maŋga > maŋga: 'million'

In bases ending with most types of consonants, the reduced morpheme is articulated as a reduced [-high] vowel after the final coda. In addition, the presence of the morpheme causes the root-final vowel to become somewhat lengthened. Thus, in terms of where it is realized phonetically, the reduced morpheme 'straddles' the final coda, rather than preceding or following it.

(22) Tapan: bases ending with consonants

    minum   > minu:m[a] 'drink'
    ayam   > aya:m[a]   'chicken'
    bulan   > bula:n[a]   'moon'
    diŋin   > diŋin[a]   'cold'
    ada   > ada:p[a]   'to face'
    laŋit   > laŋi:t[a]   'sky'
    dawat   > dawa:t[a] 'ink'
    cabut   > cabu:t[a] 'pull out'
    bəkas   > bəka:s[a] 'used, former'

ǰudul	>	ǰudu:lᵃ	'title'
iǰaw	>	iǰa:wᵃ	'green'
latay	>	lata:yᵃ	'floor'
bʁeh	>	bʁe:hᵃ	'rice (uncooked)'
mutah	>	muta:hᵃ	'vomit'
daʁah	>	daʁa:hᵃ	'blood'
anaʔ	>	ana:ʔᵃ	'child'
ləmaʔ	>	ləma:ʔᵃ	'tasty/fat'
lambeʔ	>	lambe:ʔᵃ	'slow'

For bases in which the final rime contains a [+high] nucleus and a glottal coda, in the secondary form the base-final vowel is inglided and weak vocalic articulation follows the glottal segment.

(23) Tapan: bases/roots ending with a [-low] vowel followed by [–h]/[-ʔ]

putih	>	putiᵃhᵃ	'white'
buʁuʔ	>	buʁuᵃʔᵃ	'ugly'
adiʔ	>	adiᵃʔᵃ	'younger sibling'
itiʔ	>	itiᵃʔᵃ	'duck'

These examples show that the pronoun is neither situated in a position preceding the coda, nor is it situated after the final coda (as is Tapus).

In other forms, the pronoun appears to coalesce with an underlying coda consonant. In bases ending with the velar nasal stop the derivation of the secondary form involves one of two patterns. First, in forms ending with a velar nasal where this segment is from historical *ŋ, this segment is replaced with a non-syllabic nasal vowel in the secondary form, as illustrated below.

(24) Tapan Binjai: pronominal morpheme and base ending with -ŋ: bases ending with /ŋ/

udaŋ	udaã	'shrimp'
iduᵃŋ	iduã	'nose'
kambiᵃŋ	kambiã	'goat'
goreᵃŋ	goreã	'fry'
bohoᵃŋ	bohoã	'lie'

Secondly, some forms exhibit a 'excrescent' velar nasal in final position i.e. a nasal sound inserted historically in word final position after the high vowels *i# and *u#. In these forms, the final velar nasal in the base form is replaced by a non-syllabic oral vowel in the secondary form.

(25) Tapan Binjai: Pronominal morpheme and bases ending with an 'excrescent' nasal

kakiŋ	kakiᵃ	'leg'
kayuŋ	kayuᵃ	'wood'
taliŋ	taliᵃ	'rope'
atuŋ	atuᵃ	'ghost'

In summary, we have seen that the reduced pronominal morpheme replaces or coalesces with the final coda in bases which otherwise surface with a velar nasal stop. Moreover, in bases with other types of final codas, the pronominal morpheme 'straddles' the final coda segment.

Based on these facts, Gil and Mckinnon (2014) argue that the pronoun coalesces with the segment which occupies the final coda of the root.

Assuming this analysis is correct, Tapan represents an intermediate stage between varieties in which the pronoun/suffix is realized as a suffix and varieties where it is realized as an infix.

Jernih Sarolangun

In Jernih, the reflex of the 3rd person pronoun/suffix occurs as a phonologically reduced segment which precedes the final coda of the base, and thus behaves like an infix. However, in addition to behaving like an infix, the pronoun/suffix may also cause changes in the final vowel nucleus and consonant coda of the base, changes in vowel height and debucalization of the coda consonant. Let us consider bases ending in closed syllables before turning to bases ending with open final syllables.

If the base contains a final coda, the reduced pronoun/suffix is realized as ingliding following a [-low] nucleus, and as lengthening with a [+low] nucleus.[4]

(26) Jernih: Bases with a final coda
a. Forms ending with [-low] vowel

Basic Form	3rd Person/Suffix	
dʊdʊʔ	dʊdʊːᵊʔ	'sit'
habɪnt	habɪːᵊnt	'crescent'
cəlomp	cəloːᵊmp	'to dip'
laher	laheᵊr	'neck'

b. Forms ending with a [+low] vowel

Basic Form	3rd Person/Suffix	Gloss
anaʔ	anaːʔ	'child'
panayç	panaːyç	'hot'
pʊtaʁ	pʊtaːʁ	'turn'
tanam	tanaːm	plant'

In bases ending with a rime containing a low vowel nucleus (*a* or *ɒ*) followed by one of the coronal codas *t* or *(y)ç*, the addition of the reduced morpheme may also cause fronting and raising of the vowel ([+low] → [e]) as well as debucalization of the coda consonant ([*t*]→[*ʔ*] and [*(y)ç*]→ [*h*]).

(27) Vowel raising/fronting and debuccalization

Basic Form		Pronoun/Suffix	Gloss
balɒyç	>	balɒːyç *or* baleːᵊh	'reply'
kəʁayç	>	kəʁaːyç *or* kəʁeːᵊh	'hard'
padɒnt	>	padɒːnt *or* padeːᵊʔ	'dense'
səsant	>	səsaːnt *or* səseːᵊʔ	'off course'

Now, let us consider bases which end with an open syllable. When the reduced post-root morpheme appears with a base ending with the low vowel *a*, the morpheme is realized as lengthening of this vowel (e.g. *ʊsaha* 'effort' vs. *ʊsaha:* 'his/her/the effort'). With bases that end with a non-low vowel, the reduced morpheme is realized as a central glide.

(28) Jernih: Vowel final bases
      Forms ending with [-low] vowel

Basic Form	3rd Person/Suffix	Gloss
ɪbʊ	ibo:ˀ	'sad'
lʊpʊ	lʊpo:ˀ	'forget'
bəliʸ	bəlɪ:ˀ	'buy'
matiʸ	matɪ:ˀ	'dead'
hapuʷ	hapʊ:ˀ	'broom'
ɪnduʷ	ɪndʊ:ˀ	'long for'

Some additional discussion of these forms is warranted, since the addition of the reduced morpheme may cause additional changes in the quality of the root-final vowel. First, in forms which historically end with a high vowel, this vowel is inglided in the citation form; however, when such forms occur with the reduced morpheme, the final vowel is realized as a slightly lowered high monophthong (e.g. *bəliʸ* 'buy' vs. *bəlɪˀ* 'the/its buying'; *ɪnduʷ* 'long for' vs. *ɪndʊˀ* 'his/her/the longing').[5] Secondly, in many bases which exhibit the high vowel [ʊ] in final position in citation form, this vowel surfaces as [o] in forms containing the reduced morpheme (e.g. *lʊpʊ* 'forget' vs. *lupo:ˀ* 'his/her/the forgetting'). An analogous alternation between [ɪ] and [e] is found in a very limited number of forms (e.g. *gawɪ* 'work' vs. *gawe:ˀ* 'his/her/the work').[6,7]

The following diagram summarizes changes in vowel quality between citation forms and forms containing a reduced pronoun/suffix.

(29) Jernih: changes in final vowel quality (form with reduced pronoun/suffix → citation form)
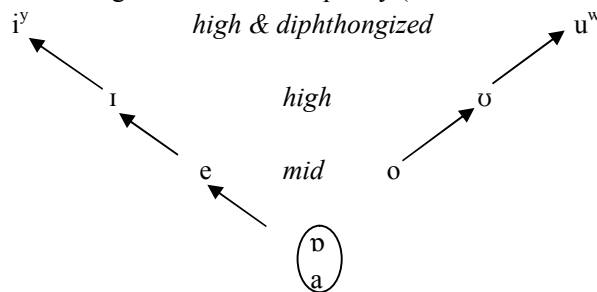
In summary, both Tapan and Jernih Sarolangun are varieties in which the pronoun (and suffix) are phonologically incorporated into the base. In the case of Tapan, the pronoun is attached directly to the final coda position of the base; whereas, in Jernih Sarolangun the pronoun directly precedes the final coda of the base. Moreover, in addition to being phonologically realized as an infix, the reduced morpheme in Jernih also causes changes in the nucleus vowel and coda rime of the final syllable of its base. In this sense, the reduced pronoun/affix in Jernih represents a transitional variety between varieties where the pronoun/suffix is a distinct segment which is added to a base (e.g. Tapus and Tapan) and varieties in which the historical pronoun/affix is realized via a morphophonological rule.

STAGE IV: POST-ROOT MORPHOLOGY IS REALIZED VIA A MORPHOPHO-NOLOGICAL RULE

Rantau Panjang

In Rantau Panjang, unlike the other varieties we have discussed, post-root morphology is not reflected as a reduced suffix or infix, but rather as a morphophonological rule which affects the properties of root final vowels. The derivation of the ablaut form (which occurs in environments where a 3rd person pronoun or suffix occurred historically) involves raising the final vowel of the base and insertion of [h] into coda position (when that position is empty). This derivation is illustrated by the diagram below:[8]

(30)
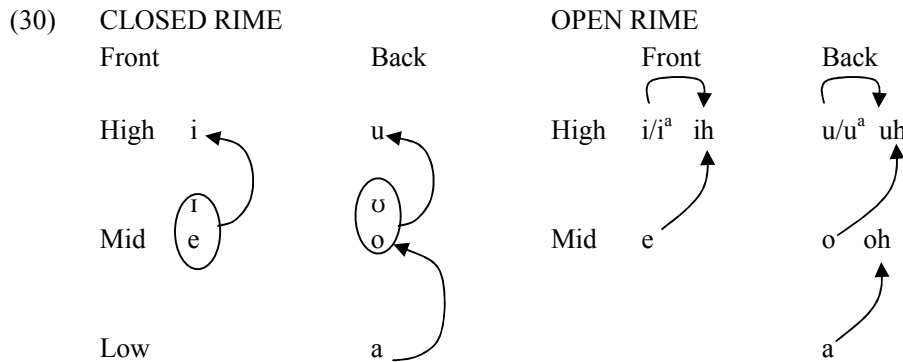
Roots for which the final rime contains the low vocalic nucleus /a/, for example, exhibit a secondary form rime containing the mid nucleus [o].

(31)	Rime	Basic Form	Secondary Form	Gloss
	-ay	capay	capoy	'reach/achieve'
		santay	santoy	'relax'
	-aw	pulaw	pulow	'island'
		kidaw	kidow	'left handed'
	-aʔ	tgaʔ	tgoʔ	'stand'
		paǰaʔ	paǰoʔ	'tax'
	-ah	dirah	diroh	'region'
		gtah	gtoh	'sap'
	-a	data	datoh	'flat'
		dŋa	dŋoh	'hear'
	-al	tiŋᵍal	tiŋᵍol	'stay'
		paŋkal	paŋkol	'base'
	-aŋ	kɲaŋ	kɲoŋ	'full (not hungry)'
		bayaŋ	bayoŋ	'shadow'
	-an	uǰan	uǰon	'rain'
		kanan	kanon	'right'
	-am	alam	alom	'nature'
		malam	malom	'night'
	-amp	taŋkamp	taŋkom	'catch'
		siyamp	siyomp	'ready'

-ant	ktant	ktont	'tight'
	liwant	liwont	'pass by'

For bases in which the final syllable contains the mid vowels /e/ or /o/, the rime of the secondary form will contain high nucleus [i] and [u], respectively.

(32)
Rime	Basic Form	Secondary Form	Gloss
-eh	maleh	malih	'lazy'
	lpeh	lpih	'release'
-eʔ	kbeʔ	kbiʔ	'tie'
	biheʔ	bihiʔ	'weight'
-o	mato	matuh	'eye'
	pso	psuh	'force'

Likewise, in base forms containing the nuclei /ɪ/ and /ʊ/, the rime of the secondary form contains the high vowels [i] and [u], respectively.

(33)
Rime	Basic Form	Secondary Form	Gloss
-ʊh	plʊh	pluh	'sweat'
	guhʊh	guhuh	'thunder'
-ʊʔ#	masʊʔ	masuʔ	'enter'
	gpʊʔ	gpuʔ	'fat'
-ʊŋ#	kŋkʊŋ	kŋkuŋ	'throat'
	kampʊŋ	kampuŋ	'village'
-ʊl#	kumpʊl	kumpul	'gather'
	bakʊl	bakul	'basket'
-ʊr#	ǰuǰʊr	ǰuǰur	'fair/honest'
	giyʊr	giyur	'flatter'

(34)
Rime	Basic Form	Secondary Form	Gloss
-ɪh	lbɪh	lbih	'more'
	pilɪh	pilih	'choose'
-ɪʔ	naɪʔ	naiʔ	'ascend'
	udɪʔ	udiʔ	'north/upstream'
-ɪŋ	pihɪŋ	pihiŋ	'plate'
	malɪŋ	maliŋ	'steal'
	ǰiɲʲɪŋ	ǰiɲʲiŋ	'carry in hand'
-ɪl	asɪl	asil	'result'
	tampɪl	tampil	'appearance'
-ɪr	lahɪr	lahir	'be born'
	ahɪr	ahir	'end'

An additional property of the alternation is that, for bases ending with open syllables, the secondary form appears with the final coda [h]. Thus, for bases containing a final non-high vowel, the same vowel in the secondary form is raised along the same lines as the examples above, and [h] appears in the final coda position.

(35)	Rime	Basic Form	Secondary Form	Gloss
	-a	tawa	tawoh	'offer'
		miǰa	miǰoh	'table'
		kǰa	kǰoh	'pursue/chase'
	-o	blanǰo	blanǰuh	'shopping'
		mato	matuh	'eye'
		dniyo	dniyuh	'world'
	-e	cabe	cabih	'chili'
		tante	tantih	'aunt'
		lunte	luntih	'prostitute'

In roots which contain an open final syllable with a high vowel, this vowel remains the same in the secondary form and [h] occupies the final coda.

(36)	Rime	Basic Form	Secondary Form	Gloss
	-u	abu	abuh	'ash'
		bum^{b}u	bum^{b}uh	'spice'
		pintu	pintuh	'door'
	-i	tiŋ^{g}i	tiŋ^{g}ih	'tall'
		ati	atih	'liver'
		pagi	pagih	'morning'

The inglided vowels i^a and u^a behave in much the same way as monophthongs in open syllables. In the secondary forms of such roots, ingliding is lost (i.e. i^a and u^a become i and u, respectively), and [h] is inserted as a coda.

(37)	Rime	Basic Form	Secondary Form	Gloss
	-u^a	uku^a	ukuh	'measure'
		ancu^a	ancuh	'destroy'
		dapu^a	dapuh	'kitchen'
	-i^a	piki^a	pikih	'think'
		ili^a	ilih	'south'
		liyi^a	liyih	'neck'

In summary, in Rantau Panjang, unlike Tapan, Tapus, Lempur, and Jernih Sarolangun, the reflex of the 3rd person pronoun and suffix is a regular morphophonological rule which raises the base final vowel (and, in the case of final open syllables, inserts *h* into coda position).[9]

CONCLUSION

In this paper, we have described key phonological properties of weakly alternating traditional Malay varieties. The data we have presented not only illustrate the fact that weakly alternating varieties are spoken across a wide geographic region of Sumatra, they also show that the alternation is manifested in phonologically diverse ways across the region. We have shown that weakly alternating varieties differ in the degree to which historical post-root morphology has been incorporated into the base phonologically. In Tapus and Lempur Tengah, varieties which we described as exhibiting 'Stage II' alternations, historical post-root morphemes have undergone considerable phonologically reduction, yet they remain in their historical position, at

the right edge of the base. In Jernih Sarolangun and Tapan, varieties which we described as having 'Stage III' alternations, the historical post-root morphemes are reflected as reduced segments which are phonologically incorporated into the base as an infix in most forms. Finally, in Rantau Panjang, which exhibits 'Stage IV' alternations, we observed that the historically post-root morphemes are not segmentable, but rather constitute a regular morphophonological rule affecting the base.

Having established phonological reduction and incorporation as prevalent historical process in Malayic varieties in Sumatra, the question arises whether apophony developed as a result of shared innovations within a single branch of Malayic or whether these changes occurred independently in several regions. We see strong evidence in favor of the view that the alternation developed independently.
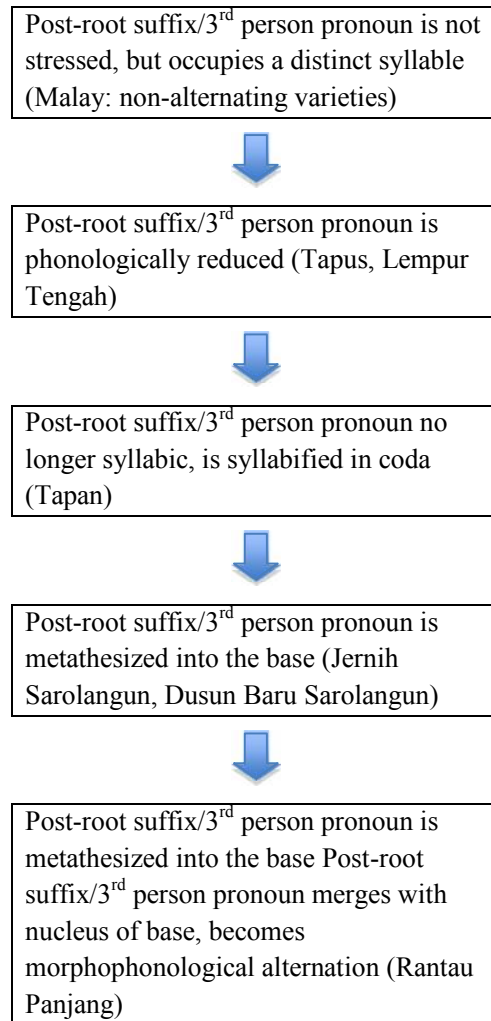
In particular, a shared innovation analysis fails to account for the sporadic distribution of alternating varieties. As we have seen, the word-shape alternations are found both in Minangkabau and non-Minangkabau varieties. Although our current understanding of the internal genetic classification of Malayic languages in Sumatra is quite limited, dialectology in the region has demonstrated the existence of some shared phonological changes which argue for classifying Minangkabau(ic) as a distinct genetic group. It has been observed that in most 'core' Minangkabau varieties root-final obstruents were lost historically (i.e. *-up,*-ut > -uyʔ; *-it>-iʔ; *-at>-eʔ; *-ap>-oʔ; *-as>-eh) and historical high vowels *i and *u in final syllables became inglided before certain final codas (some or all of the following: __r#; __l#, __ʔ#, __h#, __ŋ#). Tapus underwent these same changes historically (as is evident from the examples we presented earlier). If the development of the word-shape alternation were an innovation shared by Tapus and other non-Minangkabau varieties, like Rantau Panjang and Jernih Sarolangun, and thus predated the development of Minangkabau as a distinct branch of Malayic, we would expect that 'core' Minangkabau varieties would also exhibit a word-shape alternation similar to the alternation found in Tapus; however, this is not the case. These facts lead us to conclude that the Tapus alternation developed independently within Minangkabau.

Minangkabau varieties aside, we also find evidence that the word-shape alternation in the Malay varieties of Jambi developed independently. This can be seen by comparing the phonological realization of the alternation in Jernih Sarolangun, Rantau Panjang, and Lempur Tengah. As we have seen, in Jernih the secondary form is primarily manifested via insertion of schwa or a low vowel between the final coda and final vowel of the root. In contrast, in Rantau Panjang, the secondary form is marked by vowel raising and insertion of a coda [h], without lengthening. In Lempur, the alternation is realized by insertion of a vowel which assimilates to the final vowel of the root, and thus exhibits allomorphs with diverse phonetic properties. The diverse phonological manifestation of the alternation suggests that the alternation developed independently in each variety.

This being said, the fact that in so many varieties the secondary form is marked by insertion of a phonologically reduced morpheme suggests that shared language internal pressures lead to the development of the weak alternation. Specifically, we propose that post-root morphology appears in a prosodically weak position. Moreover, taken together, the alternating varieties we have described above illustrate a particular diachronic path in the development of root-shape alternations, as represented in (38), whereby post-root morphemes (e.g. pronouns, applicative markers) underwent gradual phonological reduction, first losing their status as distinct syllables, and then becoming phonologically manifested as a reduced sonorant

segment situated in the final syllable of the base (as a coda (e.g. Tapan) or nucleus (e.g. Jernih, Sarolangun)). From this stage, coalescence of the pronoun/suffix segment with the nucleus lead to the development of a morphophonological alternation of the type observed in weakly alternating varieties.

(38) Path of diachronic change

> Post-root suffix/3rd person pronoun is not stressed, but occupies a distinct syllable (Malay: non-alternating varieties)

⬇

> Post-root suffix/3rd person pronoun is phonologically reduced (Tapus, Lempur Tengah)

⬇

> Post-root suffix/3rd person pronoun no longer syllabic, is syllabified in coda (Tapan)

⬇

> Post-root suffix/3rd person pronoun is metathesized into the base (Jernih Sarolangun, Dusun Baru Sarolangun)

⬇

> Post-root suffix/3rd person pronoun is metathesized into the base Post-root suffix/3rd person pronoun merges with nucleus of base, becomes morphophonological alternation (Rantau Panjang)

NOTES

[1] All data in this paper are transcribed in the International Phonetic Alphabet, except for the voiceless palatal stop, the voiced palatal stop, and the palatal glide, which for reasons of simplicity are transcribed as 'c', 'j', and 'y', respectively.

[2] We assume phonological features are privative; accordingly, we also assume that vocalic and glottal segments do not contain a feature [consonant]. We assume that the glottal sounds do not exhibit these features and thus are 'invisible' to spreading.

[3] Although, as in other Minangkabau and Malayic varieties, vowels in Tapus are predictably nasalized following nasal consonants (e.g. tamũ 'guest'), the echoed vowels appearing in the secondary form seem to exhibit a higher degree of nasality (e.g. tamũ̃ũ̃ 'the guest').

[4] As in Lempur, the addition of the suffix also affects the realization of final stop segments. In final position, the reflexes of *m, *n, and *ŋ are realized as p^m, t^n, and $k^ŋ$ in phrase-final position, except in forms where the preceding onset is a nasal segment. In secondary forms, these final stops are consistently realized as nasal stops regardless of phrasal position.

[5] We analyze the high diphthongs iy and uw as allophones of underlying monophthongs. We have observed that dipthongization of these vowels occurs in phrase final positions.

[6] There is some evidence in our database (albeit rather inconsistent) to suggest that the alternations [ɪ]~[e] and [ʊ]~[o] are phrasally conditioned. For example, one finds the form *gawe* in phrase internal environments e.g. preceding a possessor *gawe lakiᵊ* (work husband-pro) 'her husband's work'.

[7] The alternation [ʊ]~[o] is robust, and involves roots ending with Proto-Malayic *a#.

[8] In Rantau Panjang, some secondary forms of bases ending with /h/ or an open syllable appear with the suffix -n. These forms are cognates of morphologically complex forms which, in other varieties of Malay, occur with peN--an, -an or an applicative suffix. We see -n as a phonologically reduced morphological remnant of such affixes.

[9] Not all roots alternate; however, the set of roots which fail to alternate is predictable, and includes forms in which the final rime is closed and contains a high vowel.

Non alternating forms:

-int	laŋint	'sky'
-in	aŋin	'wind'
-unt	takunt	'afraid'
-un	daun	'leaf'
-imp	gaimp	'magic'
-im	musim	'season'
-ump	tutump	'close'
-um	minum	'drink'

REFERENCES

Ernanda. (2015). *A grammatical description of Pondok Tinggi Kerinci*. Unpublished manuscript, University of Leiden, Leiden.

Gil, D., Kurniati, S., Wichmann, S., & Putri, Y.P. (2011, June). *Tapan: An exploration in Malayic subgrouping*. Paper presented at the Fifteenth International Symposium on Malay/Indonesian Linguistics, Universitas Islam Negeri Malang, Malang, Jawa Timur, Indonesia.

Gil, D., & Mckinnon, T. (2014, May). *Codas with vowels in Western Sumatra*. Paper presented at the 24th Annual Meeting of the Southeast Asian Linguistics Society, Yangon University, Myanmar.

McKinnon, T. (2011). *The morphophonology and morphosyntax of Kerinci word-shape alternation* (Unpublished doctoral dissertation). University of Delaware, Newark.

McKinnon, T., Cole, P., & Hermon, G. (2011). Object agreement and 'pro-drop' in Kerinci Malay. *Language, 87*(4), 715-750.

McKinnon, T., Cole, P., Hermon, G., & Yanti. (under review). *From allophony to syntax in Malay*. Manuscript submitted for publication.

Prentice, D.J., & Usman, A.H. (1978). Kerinci sound-changes and phonotactics. In S.A. Wurm & L. Carrington (Eds.), *second international conference on Austronesian Linguistics, fascicle I, Western Austronesian, Pacific Linguistics C-61* (pp. 121-163). Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.

Steinhauer, H., & Usman, A.H. (1978). Notes on the morphemics of Kerinci (Sumatra). In S. A. Wurm & L. Carrington (Eds.), *second international conference on Austronesian Linguistics, fascicle I, Western Austronesian, Pacific Linguistics C-61* (pp. 483-502). Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.

Usman, A.H. (1988). *Fonologi dan morfologi bahasa Kerinci dialek Sungai Penuh* (Unpublished doctoral dissertation). Universitas Indonesia, Jakarta.

Yanti. (2010). *A reference grammar of Jambi Malay* (Unpublished doctoral dissertation). University of Delaware, Newark.