# VIETNAMESE RHYME

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ABSTRACT. Various places of articulation, e.g. coronal, velar, labial, and laryngeal, have been proposed as being unmarked for consonants. This paper provides a description of the rhymal systems in the two major dialects of Vietnam, Hanoi and Saigon, and argues that in all Vietnamese dialects there is a placeless consonant. In the Hanoi dialect this consonant is realized as a coronal from Coronal Default. In the Saigon dialect the placeless consonant is determined by the quality and quantity of the preceding vowel: a coronal after a short front vowel; otherwise a velar. The feature-sharing between the vowel and final consonant is carried out through a constraint on the rhyme, the Syllable Weight Constraint, which also accounts for the centralization of certain short vowels found in all dialects. The paper, therefore, provides further evidence for the claim that markedness is relative and its implementation is dialect/language-particular.*

1. INTRODUCTION. One of the central issues in phonology is underspecification, namely which place of articulation is unmarked, and various places of articulation have been argued as being unmarked for consonants: coronal (e.g. Avery & Rice 1989, Paradis & Prunet 1991), velar (Trigo 1988), both coronal and velar (Rice 1996), labial (Hume & Tsedanelis 2002), and laryngeal (Lombardi 2002). It is often noted that the restricted positions for licensing of place of articulation of consonants are root-final, stem-final, syllable-final, and word-final (Itô 1989, Goldsmith 1990, Prince 1984, Rice 1992, Yip 1991).

This paper provides a detailed description of the co-occurrence restrictions between the vowel and a syllable-final consonant in two major dialects of Vietnam, those of Hanoi and Saigon, and argues for a placeless consonant in Vietnamese. It will show that in the Hanoi dialect three places of articulation are licensed: labial, dorsal, and unspecified. In the Saigon dialect there are only two such places:

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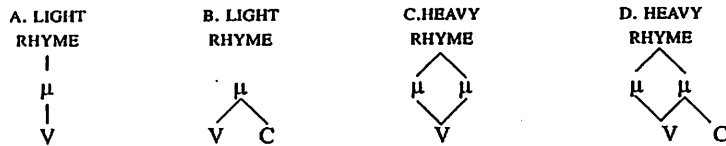A. LIGHT RHYME — B. LIGHT RHYME — C.HEAVY RHYME — D. HEAVY RHYME

Figure 2. Moraic respsentation of syllable types

els; however, short vowels occur only in closed syllables. Thus, in Figure 2 CVC is light but CVV or CVVC is heavy. In Vietnamese VV can be either a long vowel or a diphthong. Final consonants are not affected in CVVC syllables.

In nonmoraic theory branching and nonbranching in the nucleus are used to distinguish light and heavy syllables. Ewen & van der Hulst (2001:134) claim that there are two types of languages. One type is rhyme-weight languages in which the nucleus plays no role in the distinction between light and heavy syllables. The other type is nucleus-weight languages in which branching nuclei are heavy and non-branching nuclei are light. Figure 3 represents the possibilities of nucleus-weight languages.

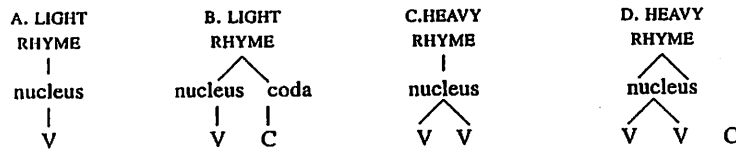A. LIGHT RHYME — B. LIGHT RHYME — C.HEAVY RHYME — D. HEAVY RHYME

Figure 3. Nucleus-weight languages

Using Figure 3 as a working model, this paper will show that Vietnamese is a nucleus-weight language in which a light rhyme, i.e. a monomoraic rhyme with a short vowel and a final consonant as in Fig. 2b, is the domain of feature sharing and centralization of the vowel.

3. THE RHYMAL DISTRIBUTION. As observed in the literature (Thompson 1965, Huỳnh 1996, Cao 1988, Vương 1975), the most striking difference between the Hanoi and Southern dialects (from Huế southward to the southernmost area) is the distribution of coronals and velars in the rhymal position. However, there are scattered observations on this topic and the various local dialects have not been thoroughly investigated.

This paper presents the consonantal rhyme systems of the two major dialects, i.e. those of Hanoi (North) and Saigon (South), and focuses on two problems within these: (i) one dialect has rhymal coronal consonants in situations in which the other has rhymal velar consonants; and (ii) the asymmetry in the realization of coronal and velar consonants after vowels since certain vowels appear with both coronals and velars but other vowels can occur only with either coronals or velars.

The data from two dialects given in 1 illustrate these facts. Tones are not a focus in this paper. The tonal diacritics, therefore, are shown only in the orthography but not in the phonetic transcription.

(1) Comparative phonetic data on final consonants in Vietnamese dialects

| ORTHOGRAPHY | HANOI | SAIGON | GLOSS |
|---|---|---|---|
| a. đứt | [dɨt] | [dɨk] | 'be broken' |
| b. ớt | [ʔəːt] | [ʔəːk] | 'pepper' |
| c. khát | [xaːt] | [xaːk] | 'thirsty' |
| d. mắt | [mat] | [mak] | 'eyes' |
| e. hét | [hɛːt] | [hɛːk] | 'to scream' |
| f. chuột | [cuət] | [cuːk] | 'mouse' |
| g. đích | [dic] | [dit] | 'target' |
| h. lệnh | [leɲ] | [lɔːn] | 'order' |
| i. khách | [xac] | [xat] | 'guest' |
| j. khác | [xaːk] | [xaːk] | 'different' |
| k. khắc | [xak] | [xak] | 'to engrave' |

As 1 shows (and ignoring the correspondences involving vowels), coronals in the Hanoi dialect correspond to velars in the Saigon dialect (1a-f) and palatals in the Hanoi dialect correspond to coronals in the Saigon dialect (1g, h, and i). In addition, both coronals and velars occur after [i], [əː], and [a] in the Saigon dialect (1a & g, b & h, d & i, respectively); however, only velars occur after the other vowels in the Saigon dialect, i.e. [aː], [ɛː], and [uː]. After the long [aː] and short [a], velars in Hanoi correspond to velars in the Saigon dialect (1j, k).

This paper will show that velars are specified for [dorsal] in the Hanoi dialect but result from phonetic implementation in the Saigon dialect; coronals result from Coronal Default in the Hanoi dialect, but result from spreading of [coronal] from short front vowels in the Saigon dialect.

4. THE HANOI DIALECT. This section presents a description of rhyme in the Hanoi dialect and discusses the asymmetrical problems with /a/ and /ɛ/ as well as solutions.

4.1. DESCRIPTION OF RHYME IN THE HANOI DIALECT. The Hanoi dialect is generally considered to represent standard Vietnamese. All vowels are followed by the full range of final consonants: labial, coronal, and dorsal. It also displays a centralization phenomenon which is much discussed in the Vietnamese literature.

A Vietnamese syllable maximally has an onset, nucleus, coda, and a tone, and minimally has an onset, a nucleus, and a tone. A nucleus can be a single vowel, short or long, or a diphthong, i.e. an element that consists of two vocalic segments both of which occupy the nucleus. There is a single initial cluster Cw and there are no final clusters. The patterns of syllables in the Hanoi dialect are shown in 2.

(2)   Patterns of syllables in the Hanoi dialect
      C(w)V(C)      C(w)VV(C)
      (C in final position represents a consonant or glide, V represents a single vowel, and VV represents a long vowel or a diphthong.)

Only a limited number of segments occur syllable-finally and there is slight variation from dialect to dialect, e.g. there are no palatals in the Saigon dialect. In the Hanoi dialect, ten consonants and two glides occur in the coda position. The phonetic final inventory is shown in Table 1.

| consonants | p | t | ʲk | k | kᵖ |
|---|---|---|---|---|---|
| | m | n | ʲŋ | ŋ | ŋᵐ |
| glides | w | j | | | |

Table 1. Phonetic final inventory in the Hanoi dialect

Phonetically, five stops [p, t, ʲk, k, kᵖ], five nasals [m, n, ʲŋ, ŋ, ŋᵐ], and two glides [w, j] occur in the coda.[1] Phonemically, there are only three places of articulation finally: labial, coronal, and dorsal. Plain, palatalized, and labialized dorsals are allophones of the same phoneme in this position. In the literature and in Vietnamese orthography the palatalized velars are presented as plain velars 'c' and 'ɲ', phonetically and phonemically, depending on the account (see Cao 1998 for an overview). These two plain palatals are treated as phonemes in the initial inventory in all accounts, as seen in Table 2.

The Hanoi dialect has nineteen phonemic syllable-initial consonants, as in Table 2.[2] /p/ does not occur initially nor do the glides /j/ and /w/; however, /w/ can be prevocalic but must follow an initial consonant other than a labial, i.e. *bw, *fw, *vw, *mw, except in some borrowed words, e.g. boa [bwa] 'garden pea' (Fr. petit-pois) or 'tip' (Fr. pourbois), voan [vwa:n] 'veil' (Fr. voile), phuy [fwi] 'barrel' (Fr. fût). Some examples with non labial clusters are hoa /hwa/ 'flower', toán /twa:n/ 'mathematics', quên /kwen/ 'to forget'.

| | LABIAL | DENTAL | PALATAL | DORSAL | GLOTTAL |
|---|---|---|---|---|---|
| voiceless stop | | t | c | k | ʔ |
| voiced stop | b | d | | | |
| aspirated stop | | tʰ | | | |
| voiceless fricative | f | s | | x | h |
| voiced fricative | v | z | | ɣ | |
| lateral approximant | | l | | | |
| nasal | m | n | ɲ | ŋ | |

Table 2. Phonemic initial consonants in the Hanoi dialect

[1]This paper discusses only final consonants. Glides are slightly different and not a focus here.

[2]Glottal stop is not represented in the orthography. Some authors do not list it in the inventory of initial consonants (Vương & Hoàng 1994, Hữu & Vương 1980). The assumption here is that the glottal stop is phonemic (Đoàn 1977, Ferlus 1982).

A full set of examples of initial consonants is given in 3. The following section will discuss the phonemic status of certain vowels and final consonants but here brackets are used for the transcription (except for initials, which are phonemic in the examples below).

(3)   A full set of examples of initial consonants in the Hanoi dialect

| ba [ba] | 'three' | lắm [lam] | 'very' |
|---|---|---|---|
| phải [fa:j] | 'right' | năm [nam] | 'five' |
| về [ve] | 'to return' | chị [chi] | 'older sister' |
| mẹ [mɛ] | 'mother' | nhỏ [ɲɔ] | 'be small' |
| tám [ta:m] | 'eight' | cá [ka:] | 'fish' |
| đủ [du] | 'enough' | khó [xɔ] | 'be difficult' |
| tha [tʰa] | 'to forgive' | gọi [ɣɔj] | 'to call' |
| sả [sa] | 'lemon grass' | ngủ [ŋu] | 'to sleep' |
| dài [za:j] | 'be long' | áo [ʔa:w] | 'blouse' |
| hát [ha:t] | 'to sing' | | |

Phonetically, the Hanoi dialect has seventeen vowels and three diphthongs. The vowels are characterized by three distinctive heights and three distinctive positions in frontness-backness. The phonetic inventory of the vocalic system is given in Table 3. The colon following a vowel represents length.

| | FRONT | | CENTRAL | | BACK | |
|---|---|---|---|---|---|---|
| high | i | i: | ɨ | ɨ: | u | u: |
| mid | e | e: | ə | ə: | o | o: |
| low | ɛ | | a | a: | ɔ | ɔ: |
| diphthong | iə | | ɨə | | uə | |

Table 3. Phonetic vowel inventory in the Hanoi dialect

The long vowel [ɛ:] lacks a short counterpart. Only long vowels and diphthongs occur in open syllables; short vowels do not, e.g. kỳ [ki:] 'strange', kệ [ke:] 'shelf', kẽ [ke:] 'small gap', cữ [kɨ:] 'to avoid', cờ [kə:] 'chess', cá [ka:] 'fish', cú [ku:] 'owl', cổ [ko:] 'ancient', cỏ [kɔ:] 'grass'. All back vowels are rounded. Hanoi has three diphthongs /iə, ɨə, uə/. Diphthongs are elements that consist of two vocalic segments both of which occupy the nucleus. Each diphthong is a combination of a high vowel and /ə/. Diphthongs can occur in either open or closed syllables. In closed syllables, e.g. tiền [tiən] 'money', tươi [tɨəj] 'be fresh', chuối [cuəj] 'banana', the diphthongs are as long phonetically as the long vowels. The vowel and /ə/ form a falling diphthong: /ə/ is weaker and shorter than the preceding vowel. Each diphthong is named by the high vowel preceding /ə/, i.e. as a front, central or back diphthong.

Table 4 provides a summary of the distribution of each vowel in the consonantal rhyme system. The symbols 'p, t, ʲk, k, kᵖ' are used to abbreviate both stops and nasals by their place of articulation. It will become clear that 'ʲk, k, and kᵖ' in the shaded cells are allophones of the dorsal consonant.

Acoustic studies (Gordina 1961) show that Vietnamese rhyme has a relatively constant, inherent length regardless of its composition (adopted in, e.g. Cù et al 1977, Hữu & Vương 1980). Rhymes ending with sonorants and with stops are separate sets with respect to length. However, when there is a vowel length contrast, the consonant is lengthened to preserve this inherent length before sonorants but not before stops (Pham 2003:146). Phonetically, the rhymes in /ka:m/, /kam/, and /kim/ have the same length. Consequently, when there is no vowel contrast, the vowel is phonetically long before labial and coronal consonants.

Several generalizations can be drawn from Table 4:

| | i | i: | e | e: | ε | ε: | i | ə | ə: | a | a: | u | u: | o | o: | ɔ | ɔ: | iə | iə | uə |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| p | | + | | + | | + | | + | + | + | + | | + | | + | | + | + | + | + |
| t | | + | | + | | + | + | + | + | + | + | | + | | + | | + | + | + | + |
| ʲk | + | | + | | + | | + | | | + | | | | | | | | | | |
| k | | | | | + | | + | + | | + | | | | | | | | | | |
| kᵖ | | | | | | | | | | | | | | | | | | | | |

Table 4. Phonetic distribution of final consonants in the Hanoi dialect

a. Labials and coronals occur after long vowels or diphthongs, except for /t/ after short [i]; labials and coronals occur after both short and long non-high central vowels.

b. Palatalized dorsals appear only after the three short vowels [i, e, a]. Some authors (e.g. Hoàng 1989, Cao 1998) observe that, phonetically, there is a glide [j] between a short front vowel and a final consonant; for example, Cao (1998:88) uses the symbols [ʲc] and [ʲŋ] to describe this property. Jones and Huỳnh (1960) transcribe the rhyme anh ách /εŋ εk/ as [ăyŋ] and [ăyk], i.e. there is a short central vowel before the dorsal with a glide between the two. Cao (1998:110) says this transcription best reflects "the most accurate pronunciation of the Northerners". This paper follows Jones and Huỳnh, and to be consistent with the labialization found in dorsals after back vowels, uses the symbols [ʲk] and [ʲŋ] to transcribe palatalized dorsals after front vowels, as in Table 5. However, to remain faithful to the literature when discussing the issue and solutions from other authors, this paper uses plain palatals.

c. Labiodorsals and plain dorsals are in complementary distribution: the former occur after the three short back rounded vowels [u, o, ɔ]; the latter occur elsewhere except after [i:] and [ə:]. Dorsals do not occur after long back vowels. Palatalized and plain dorsals are in complementary distribution except after [a].

d. Rhymes exhibit pairs that are phonemically contrastive for length, e.g. /əp/ vs /ə:p/, only when the vowel is either a mid or low central vowel [ə, a].

4 provides phonetic examples for Table 4.

(4)  Examples of final consonantal rhymes in the Hanoi dialect

| | FRONT VOWELS | CENTRAL VOWELS | BACK VOWELS |
|---|---|---|---|
| a. [CVp] | tim [ti:m] 'heart' | câm [kəm] 'mute' | cúm [ku:m] 'flu' |
| | đêm [de:m] 'night' | com [kə:m] 'cooked rice' | tôm [to:m] 'shrimp' |

| | | |
|---|---|---|
| nếp [ne:p] 'sticky rice' | thắp [tʰap] 'to light' | hộp [ho:p] 'box' |
| phép [fe:p] 'permission' | tháp [tʰa:p] 'tower' | họp [hɔ:p] 'a meeting' |
| kiếm [kiəm] 'sword' | bướm [biəm] 'butterfly' | buồn [buəm] 'sail' |
| tiếp [tiəp] 'to continue' | cướp [kiəp] 'to rob' | nhuộm [ɲuəm] 'to dye' |

b. [CVt]
| | | |
|---|---|---|
| ít [ʔi:t] 'a little' | đứt [dit] 'be broken, cut' | mút [mu:t] 'to suck' |
| in [ʔi:n] 'to print' | đất [dət] 'land, soil' | một [mo:t] 'one' |
| đến [de:n] 'to arrive' | đốt [ʔə:t] 'pepper' | tốt [to:t] 'good, excellent' |
| hết [he:t] 'to end' | mắt [mat] 'eye' | hôn [ho:n] 'to kiss' |
| đen [de:n] 'black' | mát [ma:t] 'be cool' | ngọt [ŋɔ:t] 'be sweet' |
| hét [he:t] 'to scream, yell' | khát [xa:t] 'be thirsty' | ngon [ŋɔ:n] 'be tasty' |
| giết [ziət] 'to kill' | ướt [ʔiət] 'be wet' | chuột [cuət] 'rat, mouse' |
| kiến [kiən] 'ant' | uớn [ʔiən] 'be rotten (fish)' | buồn [buən] 'be sad' |

c. [CVʲk]
| | |
|---|---|
| ích [ʔiʲk] 'be useful' | |
| đích [diʲk] 'target' | |
| lính [liʲŋ] 'soldier' | |
| ếch [ʔeʲk] 'frog' | |
| bệnh [beʲŋ] 'disease' | |
| khách [xaʲk] 'guest' | |

d. [CVk]
| | | |
|---|---|---|
| sẻng [se:ŋ] 'shovel' | đíc [dik] 'virtue' | buộc [buək] 'to tie' |
| kẻng [ke:ŋ] 'metallic bar used as gong/well-dressed' | khắc [xak] 'to engrave' | |
| điếc [diək] 'be deaf' | khác [xa:k] 'be different' | |

e. [CVkᵖ]
| |
|---|
| Úc [ʔukᵖ] 'Australia' |
| đúng [duŋᵐ] 'to be correct' |
| chồng [coŋᵐ] 'husband' |
| ong [ɔŋᵐ] 'bee' |
| khóc [xɔkᵖ] 'to cry' |

Table 4 shows that only long vowels occur in open syllables where they are entirely predictable. Consequently, they provide no clues there as to vowel length in the underlying vowel system. Only vowels in closed syllables provide such clues.

Table 5 provides the phonemic vowels and distribution of final consonants in the Hanoi dialect, except that [ʲk] and [k], allophones of the dorsal consonant, are presented in separate rows to ease the discussion below concerning the phonemic status of these sounds after the vowels /ε/ and /a/.

| | i | e | e: | ε | ε: | i | ə | ə: | a | a: | u | o | o: | ɔ | ɔ: | iə | iə | uə |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| p | + | + | | + | | | + | + | + | + | + | | + | | + | + | + | + |
| t | + | + | | + | | + | + | + | + | + | + | | + | | + | + | + | + |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | + | | | | + | + | + | | + | | + | + | + |

Table 5. Underlying vowel before final consonants in the Hanoi dialect

A comparison of Tables 4 and 5 shows that in Table 5 vowels with a length contrast are all non-high vowels. Note that in Table 4 [a] is the only vowel that allows both palatalized dorsals and plain dorsals to follow and that dorsals do not

occur after [ɛ]. However, in Table 5 [ʲk] does not occur after [a] but [k] occurs after [ɛ], as shown in double line cells. These discrepancies will be discussed below.

4.2. THE PROBLEM WITH [ɛ] AND [a] IN THE HANOI DIALECT AND SOLUTIONS. This section presents the problem of asymmetrical consonant distribution after [e] and [a], discusses solutions offered in the literature, and proposes a Syllable Weight Constraint that will eventually be shown to be even more active in the Saigon dialect. Table 4 shows that except after [a], all palatalized dorsals and dorsals are in complementary distribution: palatalized dorsals occur after the front vowels [i] and [e] and dorsals occur elsewhere. This section will show that the distribution of final consonants is symmetrical after all short vowels, i.e. palatalized dorsals after /a/ in Table 4 are underlyingly dorsals after /ɛ/, as shown in Table 5. This is a centralization phenomenon found in all short vowels although to various degrees. It is strongest with the vowel /ɛ/ in the Hanoi dialect as section 4 will show, and with all front vowels in the Saigon dialect. Centralization will be seen to be one of the results of a constraint that takes effect in a rhyme that consists of a short vowel and a final consonant.

The phenomenon of centralization of short vowels before final dorsals has been described in the literature. In this phenomenon either a front vowel or a back vowel toward the central area and is pronounced close to a central vowel of the same height. The front vowels /i/, /e/, and /ɛ/ are pronounced like [ɨ], [ə], and [a], and the back vowels /u/, /o/, and /ɔ/ are pronounced with some unrounded element, which Cao 1998 calls a DIPHTHONGIZED PROPERTY and shows with superscript symbols, [iⁱ], [eʲ], and [əʲ], and [ᵚu], [ɣʷ], and [ɑʷ], respectively.

Researchers have offered different accounts of this phenomenon. Most accounts, e.g. Haudricourt 1951, Cao 1962, Đoàn 1977, agree that there are nine short vowels: three front, three central, and three back. In this system, the palatal and labiovelar consonants are allophones of dorsals. Some accounts, e.g. Gordina 1960, Nguyễn 1965, go in an opposite direction: front vowels and back vowels are regarded as allophones of central vowels, e.g. [i] and [u] are allophones of /ɨ/. In this view, therefore, the palatals and labiovelars are phonemes separate from the plain dorsals, e.g. [ic] is /ic/, [ukᵖ] is /ikᵖ/, and [ik] is /ik/. Although the various hypotheses result in different inventories, all try to account for the change in vowel quality by reference to the following consonants.

This paper adopts Haudricourt's hyphothesis, which states that there is a length contrast in /c/, /ɛː/, /o/, and /ɔ/. It provides evidence to support this hyphothesis and argues that a Syllable Weight Constraint causes feature sharing and vowel centralization, and accounts for the realization of the final consonant.

The distributional gaps in Table 4 show that only two vowels exhibit a phonemic length distinction in closed syllables, i.e. [ə] vs. [əː] and [a] vs. [aː]. For example, palatalized dorsals and labiodorsals occur only after short vowels except after [ɛ], which has no short counterpart. This paper assumes that a vowel is underlyingly short if there is no length contrast. Therefore, [i] and [iː], [ɨ] and [ɨː],

and [u] and [uː] are phonemically /i/, /ɨ/, and /u/. Consequently, the distribution of final consonants can be reanalyzed as in Table 5, except that [ɛː] proves to be problematic. While labials and coronals can be assumed to follow the short [ɛ], dorsals can not (as in Table 4).

In Table 5 the gaps with labials after [i] and with dorsals after [əː] are accidental (Thompson 1965:61, Hữu & Vương 1980). Ferlus (1991) reports a number of words with the rhyme [əːŋ] in a dialect of Vinh, Nghệ An, Central Vietnam which still maintain many archaic features, e.g. *giờng* [zəːŋ] 'bed', *gờng* [ɣəːŋ] 'ginger', *trống* [ʈəːŋ] 'egg'. The gap with palatalized dorsals after [ɛ] will be accounted for below. Because of the complementary distribution of [k] and [kᵖ], [kᵖ] is best regarded as an allophone of /k/ after short back vowels (Hữu & Vương 1980, Cù et al. 1977).

So far as the distribution of consonants after [ə] and [ɛ] is concerned, because of the limited distribution of palatalized dorsals, they are usually treated as allophones of dorsals in the Vietnamese literature (see Hữu & Vương 1980). That is, surface [iʲk] and [eʲk] are underlyingly /ik/ and /ek/, respectively. ([ʲk] is transcribed as [c] in the literature, and this allophone will be referred to as a 'palatal' in the discussion below.) All accounts agree with this claim. However, there are different views with regard to: (i) the gap with [ɛ] in terms of the absence of palatals, and (ii) the presence of both palatals and dorsals after [a]. In Table 4, [a] is the only vowel that co-occurs with the full range of final consonants, e.g. *gặp* [ɣap] 'to meet', *mặn* [man] 'be salty', *sạch* [sac] 'be clean', and *sắc* [sak] 'be sharp', and among the short front vowels [ɛ] is the only one that does not occur with final palatals. This creates an asymmetrical pattern of consonantal distribution after [a] and [ɛ], illustrated in Table 6.

| | m/p | n/t | ŋ/c | ŋ/k |
|---|---|---|---|---|
| i | + | + | + | |
| e | + | + | + | |
| ɛ | + | + | ▩ | |
| a | + | + | ▩ | + |

Table 6. Asymmetry of [ɛ] and [a] in the Hanoi dialect

This issue has been long debated in the literature (see Đoàn 1977). The simplest solution is to assume that unlike the other front vowels /i/ and /e/, /ɛ/ does not occur with palatals. However, since this solution leaves many gaps in the system, researchers have tried to account for the distributional problem, specifically the absence/presence of a length contrast after the low front vowel [ɛ]. One account, offered by Emeneau 1951 and Haudricourt 1951, and adopted by Cao 1998, Cù et al. 1977, Vương & Hoàng 1994 among others, proposes that, given the absence of palatals after [ɛ] and the 'extra' dorsal place after [a], the surface palatals after [a] are actually underlying dorsals and the surface [a] before palatals is underlying /ɛ/. Consequently, *anh* [ʔaɲ] 'older brother' is underlyingly /ʔɛŋ/. Accord-

ing to Cao 1998, all vowels should behave in the same way before dorsals. Because front non-low vowels move toward the central area and are shortened and diphthongized, i.e. /i/ and /e/ become [ij], [ɤj], then /ɛ/ should behave in the same manner, i.e. be shortened and move toward the central vowel to produce [aɲ]. The result is a symmetrical rhyme system: all three front vowels occur before underlying dorsals, which are phonetically realized as palatals; therefore, /a/ has the same three-way distinction in the rhyme as the other vowels and occurs before labials, coronals, and dorsals, as in Table 7. Examples are given below the table in 5.

|       | m/p | n/t | ŋ/c | ŋ/k |
|-------|-----|-----|-----|-----|
| /ik/  | +   | +   | +   |     |
| /e/   | +   | +   | +   |     |
| /ɛk/  | +   | +   |     |     |
| /ak/  | +   | +   |     | +   |

Table 7. Symmetrical rhymal system

(5)  ích    /ʔik/    [ʔic]    'useful'
     éch    /ʔek/    [ʔec]    'frog'
     ách    /ʔɛk/    [ʔac]    'yoke'
     lắc    /lak/    [lak]    'to shake'

Cao (1998:93) provides still further evidence that *anh* [aɲ] is /ɛŋ/ using spelling mistakes. He notes that children and adults sometimes misspell the word *anh* as *enh* (/e/ and a palatal).

In arguing that [ac] is /ɛk/, Đoàn (1977:210) states that the vowel in words such as *cảnh* [kaɲ] 'landscape' and *ách* [ʔac] 'yoke' is phonetically close to [a] but not quite [a]. He suggests that there is obviously some influence on it from the final palatal. He also observes that [i] and [e] before palatals such as in *ích* [ʔic] 'be useful' and *éch* [ʔec] 'frog' are pronounced closer to vowels in the central area, [i] and [ə], respectively, and are also shorter than before non-palatal consonants. He concludes that [a] before palatals must be /ɛ/ in order to preserve the symmetrical distribution. He points out that the centralization of /i/ and /e/ before palatals is not as strong as the centralization of /ɛ/ in the same context. Đoàn also cites evidence from reduplication. In this process front and back vowels of the same height cooccur in disyllabic reduplicative forms, i.e. /u/ and /i/, and /o/ and /e/. For example, 6a and b below show that high and mid vowels pattern in pairs of the same height and differ only in frontness-backness. There is also an alternation between dorsals and palatals after the front vowels /i/ and /e/ in these examples. Of particular interest here is the fact that the rhymes [aɲ] and [ac] are pronounced [ɛɲ] and [ɛc] in conservative dialects of Vietnamese in the Central area. If the first two examples in 6c have the low vowels /ɔ/ and /ɛ/ before labials, then the vowel before dorsals in [lɔŋ] and [zɔk] is clearly /ɔ/, and the vowel in the second syllables [laɲ] and [zak] must be /ɛ/.

(6)  a. u - i

   *sụt sịt* [sut - sit] 'to weep silently'
   *chúm chím* [cum - cim] 'smiling'
   *đủng đỉnh* [duŋᵐ - diɲ] 'unhurriedly'
   *khúc khích* [xukᵖ - xic] 'to giggle'

   b. o - e

   *vỗ về* [vo - ve] 'to console'
   *hổn hển* [hon - hen] 'out of breath'
   *xộc xệch* [sokᵖ - sec] 'in disorder'
   *hổng hểnh* [hoŋᵐ - heɲ] 'be exposed'

   c. ɔ - ɛ

   *hom hem* [ hɔm - hem] 'emaciated'
   *tóp tép* [tɔp - tɛp] 'to eat with much noise'
   *lóng lánh* [lɔŋᵐ - laɲ] 'to glitter'
   *róc rách* [zɔkᵖ - zak] 'to babble'

Speakers in some small parts of the North Central area, e.g. in Nghệ An and Hà Tĩnh provinces, and of the South Central area, e.g. in Bình Định and Phú Yên provinces, also still pronounce the rhyme in words such as *anh* [ʔaɲ] 'older brother' as [ʔeɲ]. Cao (1998:116) notes that in a dialect such as Quảng Bình in the Central area in which many old linguistic features are preserved, modern [ʔaɲ] is pronounced as [ʔeŋ] or [ʔɛːŋ], [ʔɔŋᵐ] as [ʔɔŋ] or [ʔɔːŋ], [ʔoŋᵐ] as [ʔoŋ] or [ʔoːŋ], and [ʔuŋᵐ] as [ʔuŋ] or [ʔuːŋ].

This account, however, does not consider whether there is a length contrast in /e/ before dorsals. Except for Haudricourt (1951) and Emeneau (1951), its proponents ignore a number of words in which a long [ɛː] surfaces with a plain dorsal, i.e. a dorsal that is not labialized as in *sẻng* [sɛːŋ] 'shovel', *eng éc* [ɛːŋ ɛːk] 'to shriek', *leng keng* [lɛːŋ kɛːŋ] 'tinkling', *lẻng xẻng* [lɛːŋ sɛːŋ] 'to rattle', *phèng (la)* [fɛːŋ] ([la]) 'cymbal' (Nguyễn 1975), *séc* [sɛːk] 'check' ( Fr. 'cheque'), *Sa déc* [sa dɛːk] 'place's name'. The set of words with the rhyme [ɛːŋ] is excluded from the system because many of the words are onomatopoetic and regarded as NONPRODUCTIVE. This account claims that there is no difference in the underlying forms of such different words as those in 7. (The pairs in 7 have the same tone.)

(7)  Underlying representations, assuming there is no length contrast with /e/

   *kẻng* [kɛːŋ]        /keŋ/    'gong'
   *cảnh* [kaɲ]         /keŋ/    'site'
   *xẻng* [sɛːŋ]        /seŋ/    'shovel'
   *sảnh* [saɲ]         /seŋ/    'hall/court'
   *(tôi quên) bánh*
       *(toj kwen)* [baɲ]   /beŋ/    'I + forget + cake = I forget a cake'
   *(tôi quên) béng*
       *(toj kwen)* [bɛːŋ]  /beŋ/    'I + forget + bound morph = I totally forget'

If these words are ignored because they are so few, there are other rhymes that should also be eliminated because they too have few instances, e.g. [it] as in *dứt* [dit] 'a cut' and [iəm] as in *ướm* [ʔiəm] 'to try'; however, such words are never excluded.

The second account, especially Haudricourt (1951), the one adopted here with some modification, also agrees with the first one in that [ac] is /ɛk/, but suggests the existence of a length contrast in the vowel /e/ before dorsals. That is, surface

[aɲ] is underlyingly /ɛɲ/ and surface [ɛːŋ] is underlyingly /ɛːɲ/. This second account also introduces not only a long front lower mid /eː/ but also /eː, oː, ɔː/ predicated on the existence of words such as *côông kêng* [koːŋ keːŋ] 'to carry someone astride over one's shoulders', *bôông bêng* [boːŋ beːŋ] 'to float' (Thompson 1965), and *tòong teng* [toːŋ tɛːŋ] 'to dangle'. In these words [eː] surfaces with dorsals not palatals. Such words are now used very infrequently in Vietnamese except that [ɔːŋ] still occurs in loan words, e.g. *(rờ') moọc* [(rə) mɔːk] 'trailer' (Fr. 'remorque') and *(sà lách) xoong* [sɔːŋ] 'watercress' (Fr. 'cresson') or 'pot' (Fr. 'casserole'), *ba toong* [ba tɔːŋ] 'stick' (Fr. 'baton'), *gòong* [ɣɔːŋ] 'coach' (Fr. 'wagon'), and in a few onomatopoetic words. The existence of the forms with [ɛːŋ], [ɔːŋ], [eːŋ], and [oːŋ] suggests that these rhymes were at one time productive in Vietnamese. In this account the underlying vowel system is as in Table 8.

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| i |   | ɨ |   | u |   |
| e | eː | ə | əː | o | oː |
| ɛ | ɛː | a | aː | ɔ | ɔː |

Table 8. Underlying vowel system with length contrast in all non-high vowels

The marked distribution of palatals and dorsals in Table 5 may be accounted for as in 8 where /ɛ/ contrasts in length.

(8)  /ik/    [ic]
     /ek/    [ec]
     /ɛk/    [ac]
     /ɛːk/   [ɛːk]

Traditionally, front vowels before palatals and back vowels before dorsals have been treated as short variants of the same corresponding phonemes. This paper adopts the second account: there is a length contrast in all non-high vowels as in Table 8, and will extend this account by using a constraint on syllable weight to explain the presence of a palatalized dorsal after front vowels, the existence of a labialized dorsal after back rounded vowels, and the occurrence of a plain velar after central and long vowels. The analysis proposed in this paper accounts for the surface forms of final consonants not only after short vowels but also after diphthongs and long vowels, including rare rhymes.

4.3. THE SYLLABLE WEIGHT\CONSTRAINT. The close relationship between palatals, coronals, and front vowels is observed in many languages. Every theory of features tries to accommodate it. For example, for palatals in Chinese, the articulator-based theory uses both the feature Coronal to account for the alternation between the palatal [ç] and the coronal [sʲ] and the feature [-back] to account for a close relationship between palatals and front vowels (Duanmu 2002). This relationship is also seen in Vietnamese, especially in the Saigon dialect.

Given the facts that coronals occur only after short vowels and that the asymmetrical distribution of consonants is found only after short vowels, Vietnamese

is most likely a nucleus-weight language. The realization of a final consonant in Vietnamese depends on both the quality and the quantity of the preceding vowel in a light syllable as shown in Fig. 2b. If the vowel is short, the final consonant is affected by the preceding vowel. If the vowel is long (or is a diphthong), then the consonant is in a heavy syllable, e.g. Fig. 2d, and is not affected by the vowel. This fact can be captured by a constraint, namely, a Syllable Weight Constraint (SWC), which may be stated as in (9).

(9)  SWC
     a.  Short vowels must share features with following consonants.
     b.  All consonants in light syllables are subject to feature sharing with
         the vowel.

9a predicts that all consonants in a light syllable are affected by a preceding short vowel. 9b predicts that nothing happens to a consonant if the vowel is long or a diphthong.

The SWC accounts for the realization of dorsals after back vowels as follows. Because the vowel is short (see Table 4), the final consonant is affected. The feature [labial] from a back vowel spreads onto the final dorsal and the dorsal is labialized. In a front vowel the feature [coronal] from that vowel spreads onto the dorsal and it is palatalized.

In one standard model of feature geometry (e.g. Clements 1991, Clements & Hume 1995) a complex segment with major and secondary articulations is as shown in Figure 4. The secondary articulation is a dependent of the vocalic node, which is under the C-place node. [F] is any major articulatory feature. The figure shows only places of articulation, other details are omitted.

root
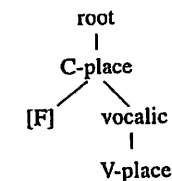|
C-place
／＼
[F]   vocalic
|
V-place

Figure 4. Representation of a complex segment

The feature can be spread from the vowel to the V-place node of the following consonant, which surfaces with secondary articulation. Figure 5 shows this process in Úc /ʔuk/ 'Australia' → [ʔukᵖ]. The feature [labial] from the back vowel spreads onto the V-place node of the final dorsal resulting in a labiodorsal.
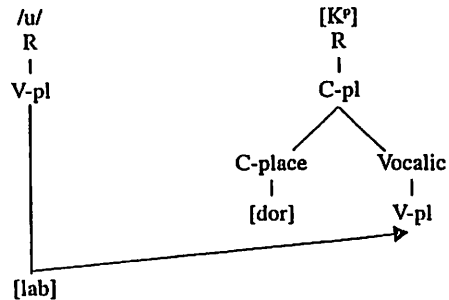
/u/                    [Kᵖ]
R                      R
|                      |
V-pl                   C-pl
                      /  \
              C-place    Vocalic
                 |          |
               [dor]      V-pl
|_____↗
[lab]

Figure 5. Labialization of dorsal /ʔuk/ 'Australia '→ [ʔukᵖ]

Rice's model, shown in Figure 1, does not require the V-place node. That the V-place feature is shared between the vowel and the following consonant is a predictable characteristic of a short VC stem and can be derived through the spreading of V-Place itself rather than of a V-place dependent (Rice, personal communication).

Similarly, the realization of a palatalized dorsal after a front vowel is the result of the spreading of the feature [coronal] from the vowel onto the dorsal to satisfy the SWC, e.g. *ích* /ʔik/ 'be useful' → [ʔiʲk]. This process could result in [kʲ], however, since final [kʲ] does not exist in Vietnamese such a surface form is disallowed, i.e. final stops are always unreleased. (Final position is not optimal for holding contrasts and perceptually palatalized consonants in this position are not robust neither articulatorily nor acoustically (Kochetov 2002)).

According to the SWC, short front vowels give the feature [coronal] to dorsals, which are realized as palatalized dorsals, and short back vowels give the feature [labial] to dorsals, which are realized as labialized dorsals. The central vowels, as argued in Clements (1991) and Steriade (1995), do not have features to give; therefore, the dorsals surface as plain dorsals.

It is now possible to reassess [aɲ] in light of the SWC to show that it is underlyingly /ɛŋ/; likewise, surface [ɛːŋ] is underlyingly /ɛːŋ/.

If [aɲ] is actually /ɛŋ/, the SWC accounts for the realization of /ɛŋ/ as [aɲ] as follows. Because the vowel /ɛ/ is short, the final dorsal is in a light rhyme; therefore, the vowel gives the feature [coronal] to the dorsal, which surfaces as a palatalized dorsal. The vowel then surfaces as a central vowel, which Cao 1998 says is the result of a tendency toward dissimilation.

One possible way to account for this dissimilation is by using a constraint on the surface that prohibits two identical features cooccurring in a rhyme with a non-branching nucleus and a consonant. The surface constraint is described in 10 where X represents either [coronal] or [labial]. This is as an Obligatory Contour Principle (OCP) effect which disallows identical features occurring adjacent to each other (McCarthy 1986, Yip 1988).

(10)  The surface constraint on the light rhyme.
      *[[X] [X]] rhyme     ← OCP violation

10 prohibits a structure in which a vowel and a consonant in a light rhyme have the same feature but does not prohibit a structure in which a vowel spreads its feature to the following consonant in a light rhyme. The constraint is not met when the nucleus is branching, i.e. when it contains a long vowel or a diphthong.[3]

Why does a low vowel lose [coronal] in the feature-sharing process but a non-low vowel does not? It may be a dialect-particular phenomenon. In the Hanoi dialect a low vowel differs from a non-low vowel in a special way: when the vowel is low, the feature [coronal] cannot be shared between a short vowel and the following consonant in a light rhyme. Thus, [coronal] is lost from the front vowel, creating a central vowel, and the [coronal] feature of this vowel is displaced onto the consonant, and the dorsal is palatalized, e.g. *anh* /ʔɛŋ/ —> [ʔaʲŋ] 'older brother'. In the following section we will see that in the Saigon dialect such centralization occurs in all short front vowels.

The OCP effect, however, cannot account for cases in which centralization is less than a full process, e.g. with non-low vowels and back vowels. Centralization in the Hanoi dialect may be a phonetic-gradient process: in /ɛ/ centralization occurs fully but it is still an incomplete process in other vowels. A vowel may be only partially centralized with half of it still maintaining the quality of the underlying vowel. Many authors reflect this partial centralization in their transcriptions, especially of back vowels before dorsals. For example, Alexander de Rhodes in the 16th century uses 'oũ,' for /uŋ/ and 'aũ,' for /ɔŋ/ (from Cao 1998), and Thompson (1965:29) uses [ʔăwng] for *ong* /ʔɔŋ/ 'bee' and [ʔâwng] for *ông* /ʔoŋ/ 'grandfather'. These partial centralized vowels present a problem with the OCP constraint because both elements in the rhyme are labial, e.g. [ʷukᵖ] in Cao's transcription for /uk/. In the Saigon dialect, however, centralization is complete in all front vowels and is also stronger in the back vowels than it is in the Hanoi dialect. A gradient-phonetic analysis offers a good account of partial centralization, but it suggests that the phonetic process is sensitive to syllable weight. (As we will see later, in the Saigon dialect centralization is much stronger and is often a full process in which the vowel quality changes almost completely and the surface form of the final consonant can be either a coronal or a velar depending on the quality of the preceding underlying vowel.)

According to Cao, a front vowel before a palatalized dorsal is centralized because of dissimilation between the front vowel and the glide [j], which is a diphthongized element of all front vowels. This paper treats the centralization as dissimilation of the feature [coronal], which is specified in a front vowel, and

_____

[3]This surface constraint is found in all dialects; however, it is sensitive to features of both vowel place and vowel height, which differ among dialects.

spreads onto the final [dorsal] in the Hanoi dialect, but the centralization in /ɛ/ is much stronger than Cao indicates and /ɛ/ surfaces as a monophthong [a].

In words like *sẻng* [sɛ:ŋ] 'shovel' such feature spreading does not occur since the vowel is long, the consonant is in a heavy syllable, and the condition for spreading is not met. The consonant, therefore, is realized as a plain dorsal, so that /sɛ:ŋ/ → [sɛ:ŋ]. If the vowels comprise a single system, why then do /ɛ/ and /ɛ:/ pattern differently, i.e. why does the short vowel occur with a palatalized dorsal but the long vowel occur only with a plain dorsal? The fact that they do not pattern the same way follows from the SWC and suggests that there must be two separate systems in the vowel inventory, one of short vowels and the other of long vowels.

Spreading in Vietnamese occurs in CVC but not in CVVC, i.e. in a syllable with a long vowel or a diphthong. The moraic hypothesis accounts for feature assimilation by spreading some feature to the following consonant as in Figure 2b, but long vowels do not because of the multiple association lines from the long vowel or diphthong to the consonant as in Figure 2d.

Although tonal issues are not relevant to the issues discussed in this paper, it is worth noting that moraic theory does not work for Vietnamese tones. A contour tone normally associates with two moras but it can occur with either a short or a long vowel in Vietnamese. This distribution poses a problem for any account that tries to use moras to represent tones in Vietnamese syllables. Therefore, the nucleus-weight model with the Syllable Weight Constraint seems to be preferable to a moraic model.

As for the dissimilation in a syllable with a diphthong, both moraic and nucleus-weight analyses face the same problem. The predictions are that in a bimoraic syllable in a moraic model as in Fig. 2c, or with a branching nucleus in a nucleus-weight model as in Fig. 3c, the two elements of a diphthong would not be affected. That is not the case: the OCP effect is found also in diphthongs. The second element in diphthongs is /ə/, which is pronounced [ʌ]; /i/ with [coronal] does not allow another vowel with [coronal]; /u/ with [labial] does not allow another vowel with [labial]; however, the central vowel /i/ has no feature and therefore allows the sequence [iʌ].

The orthography represents the second element in the three diphthongs differently depending on where the diphthong occurs in a syllable. It is presented with a vowel of the same frontness-backness as the main vowel '*iê*', '*ươ*', and '*uô*' if the diphthong is in a closed syllable. However, in an open syllable the second element is spelled identically for all three diphthongs, '*ia*', '*ưa*', and '*ua*'. According to Cao 1998:93, regardless of the difference in spelling in closed syllables, there is no difference in pronunciation of the second element in the diphthongs. He provides evidence from foreign language learning. The phonotactics of Vietnamese do not allow a sequence of two vowels which are different in frontness-backness, e.g. *[ie], *[ei], *[uo] or *[ou]. Therefore, French *tiens* [tjẽ)] becomes [tjʌ̃)] and English *show*

[ʃow] becomes [ʃəw] or [ʃə:w]. Cao also observes another type of spelling mistake with diphthongs: *cuồn* [kuən] becomes *cuân* [kwən], *quốc* [kuək] becomes *quấc* [kwək], and *mưa* [miə] becomes *mươ*[miə]. In the first two mistakes, instead of using a letter for [o] of the second element of the diphthong after a back vowel, the native writer uses the letter representing /ə/ after a back vowel. In the last example, to write the central diphthong in an open syllable, the writer uses the letter used in closed syllables instead. These mistakes show that to a native ear, the second element of the diphthong does not have the same frontness-backness as the main vowel. This evidence shows that feature sharing is not present in diphthongs; however, diphthongs can still be a domain of the OCP, which is independent of the Syllable Weight Constraint that motivates the feature sharing between a vowel and a final dorsal and determines the surface form of the final dorsal, i.e. palatalization and labialization.

This section shows that in the Hanoi dialect the SWC on the light syllable determines the surface quality of underlying dorsals. The realization of a dorsal depends on the quantity and quality of the preceding vowel. After a front vowel it receives [coronal] from the vowel and becomes palatalized. After a back vowel it receives [labial] from the vowel and becomes labialized. It is not affected by central vowels which have no feature to share. If the dorsal is in a syllable containing a long vowel, feature spreading does not occur and the final consonant surfaces as a plain dorsal. Diphthongs pattern with the long vowels. In order to receive a feature from the vowel, the dorsal must be in a light syllable. Obscuring this relationship is the presence of centralization. This process occurs only with the front vowel /ɛ/ in the Hanoi dialect. Cao (1998) treats palatals and labialized dorsals as allophones of dorsals, but he offers a different explanation for the centralization of vowels. He claims that after a front vowel [j] is inserted before a palatal and [w] is inserted before a labialized velar with the result that the vowel is dissimilated and moves closer to the central position. His analysis introduces glide epenthesis but does not account for the distribution of coronals and dorsals in Southern dialects, where full centralization occurs in all vowels. This paper focuses only on centralization that results in a complete change of vowel quality as evidence from the Saigon dialect will show in the next section. Cao suggests that centralization in the Saigon dialect might lead to a different system, and indeed the vowel inventories are different in major dialects, as this paper shows.

Example 11 provides underlying representations for all the phonetic examples given in 4. Because both coronals and dorsals occur after all vowels, it can be assumed that both [coronal] and [dorsal] are specified in rhymal position in the Hanoi dialect. However, as the paper will show later, [coronal] is best treated as Default fill-in of the unmarked feature in the Hanoi dialect.

(11) Underlying forms of consonantal rhymes in the Hanoi dialect.

| | FRONT VOWELS | CENTRAL VOWELS | BACK VOWELS |
|---|---|---|---|
| a. [CVp] | | | |
| /CVp/ | tim [tim] 'heart' | cấm [kəm] 'mute' | cúm [kuːm] 'flu' |
| | đêm [dem] 'night' | cơm [kəːm] 'cooked rice' | tôm [toːm] 'shrimp' |
| | nếp [nep] 'sticky rice' | thấp [tʰap] 'to light' | hộp [hop] 'box' |
| | phép [fep] 'permission' | tháp [tʰaːp] 'tower' | họp [hop] 'a meeting' |
| | kiếm [kiəm] 'sword' | bướm [biəm] 'butterfly' | buồm [buəm] 'sail' |
| | tiếp [tiəp] 'to continue' | cướp [kiəp] 'to rob' | nhuộm [ɲuəm] 'to dye' |
| b. [CVt] | | | |
| /CVt/ | ít [ʔit] 'a little' | đứt [dit] 'be broken, cut' | mút [mut] 'to suck' |
| | in [ʔin] 'to print' | đất [dət] 'land, soil' | một [mot] 'one' |
| | đến [den] 'to arrive' | ớt [ʔəːt] 'pepper' | tốt [tot] 'good, excellent' |
| | hết [het] 'to end' | mắt [mat] 'eye' | hôn [hon] 'to kiss' |
| | đen [dɛn] 'black' | mát [maːt] 'be cool' | ngọt [ŋɔt] 'be sweet' |
| | hét [hɛt] 'to scream, yell' | khát [xaːt] 'be thirsty' | ngon [ŋɔn] 'be tasty' |
| | giết [ziət] 'to kill' | ướt [ʔiət] 'be wet' | chuột [cuət] 'rat, mouse' |
| | kiến [kiən] 'ant' | ươn [ʔiən] 'be rotten (fish)' | buồn [buən] 'be sad' |
| c. [CVʲk] | | | |
| /CVk/ | ích [ʔik] 'be useful' | | |
| | địch [dik] 'target' | | |
| | lính [liŋ] 'soldier' | | |
| | ếch [ʔek] 'frog' | | |
| | bệnh [beŋ] 'disease' | | |
| | khách [xɛk] 'guest' | | |
| d. [CVk] | | | |
| /CVk/ | sẻng [sɛːŋ] 'shovel' | đức [dik] 'virtue' | buộc [buɔk] 'to tie' |
| | kẻng [kɛːŋ] 'metallic bar used as gong/well-dressed' | khắc [xak] 'to engrave' | |
| | điếc [diək] 'be deaf' | khác [xaːk] 'be different' | |
| | | ước [ʔiək] 'to wish' | |
| e. [CVkᵖ] | | | |
| /CVk/ | | | Úc [ʔuk] 'Australia' |
| | | | đúng [duŋᵐ] 'to be correct' |
| | | | chồng [coŋᵐ] 'husband' |
| | | | ong [ʔɔŋᵐ] 'bee' |
| | | | khóc [xɔkᵖ] 'to cry' |

5. THE SAIGON DIALECT. This section provides a description of the rhymal system of the Saigon dialect, examines the co-occurrence restriction of consonants and vowels, and argues that there are only two places of articulation, [labial] and [unspecified], in this dialect.

5.1. DESCRIPTION OF RHYME IN THE SAIGON DIALECT. It has been observed that "one of the most distinctive features of dialects from Huế to the southern tip of Vietnam is their lack of contrast between final coronals and velars" (Cao 1998:120). If the Hanoi dialect is the most conservative one in that it has a full range of final consonants in the rhyme (labial, coronal, and dorsal), the Saigon dialect is the most innovative one in that it has only two distinctive places of articulation after vow-

els, labial and dorsal. In the Saigon dialect coronals occur only after short front vowels and are in complementary distribution with dorsals. This section will show that these coronals are not present underlyingly but result from the spreading of [coronal] from a preceding front vowel. The data used here come from the literature (Thompson 1957, 1965; Nguyễn 1967, Vương 1975, Seitz 1986) and were checked with speakers of the Saigon dialect living in Toronto.

The Saigon dialect has the twenty-three phonemic syllable-initial consonants (Nguyễn 1967) shown in Table 9. In casual speech, especially among young people, /ş/ has merged with /s/, /ʈ/ with /c/, and /v/ with /j/.

| | LABIAL | DENTAL | RETROFLEX | PALATAL | DORSAL | GLOTTAL |
|---|---|---|---|---|---|---|
| voiceless stop | | t | ʈ | c | k | ʔ |
| aspirated stop | | tʰ | | | | |
| voiced stop | b | d | | | | |
| voiceless fricative | f | s | ş | | x | h |
| voiced fricative | v | z | | | ɣ | |
| lateral | | l | | ʎ | | |
| approximant | w | | r | j | | |
| nasal | m | n | | ɲ | ŋ | |

Table 9. Phonemic initial consonants in the Siagon dialect

Palatals (or palatalized dorsals) do not occur syllable-finally in the Saigon dialect. The three long high vowels [iː] [iː], and [uː] in the Saigon dialect usually correspond to the three diphthongs in closed syllables in the Hanoi dialect. However, in the Saigon dialect in final position there are three DIPHTHONGS, [iə], [iə], and [uə], that do not allow any segment to follow, e.g. kia [kiə] 'there', cửa [kiə] 'to saw', and cua [kuə] 'crab'. Because of its restricted distribution, the second DIPHTHONGAL element is best treated as a glide. Vietnamese glides do not allow a following segment. The phonetic final inventory is presented in Table 10. This section will show that in the Saigon dialect for both stops and nasals the consonants within the double lines are allophones of the unspecified place.

| consonants | p | t | k | kᵖ |
|---|---|---|---|---|
| | m | n | ŋ | ŋᵐ |
| glides | w | j | ʕ | |

Table 10. Phonetic final inventory of the Saigon dialect.

On the surface, the Saigon dialect has five short vowels [i, ɨ, a, u, ɔ], and nine long vowels [iː, eː, ɛː, ɨː, əː, aː, uː, oː, ɔː]. There are no diphthongs. The vowels are characterized by three distinctive positions in height (high, mid, and low) and three distinctive positions in frontness-backness (front, central, and back). Only long vowels are found in open syllables and all back vowels are rounded.

The phonetic distribution of rhymal consonants is as in Table 11.

|   | i | i: | e: | ɛ: | i | i: | ə: | a | a: | u | u: | o: | ɔ | ɔ: |
|---|---|----|----|----|---|----|----|----|----|----|----|----|----|----|
| p | + | + | + | + | + | + | + | + | + |   | + | + |   | + |
| t |   |   |   |   | + |   | + | + |   |   |   |   |   |   |
| k |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| kᵖ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Table 11. Phonetic distribution of consonantal ryhmes in the Saigon dialect

The phonetic properties and the distribution of vowels in rhymes may be summarized as follows.

   a. [k] and [kᵖ] are in complementary distribution: [kᵖ] occurs only after [u], [o:], and [ɔ]; [k] occurs elsewhere. The occurrence of [kᵖ] after the long [o:] is part of the unusual distinctiveness of this dialect. Short [o] does not occur before [kᵖ].

   b. [e:, ɛ:, ə:, o:] do not have short counterparts.

   c. All vowels, except for [u] and [ɔ], occur before labials.

   d. Only central vowels occur before coronals, shown within the dark lines.

Three vowels [e:], [ə:], and [o:] do not have short counterparts before a consonant: [ə:], [i], and [a] have both coronals and dorsals as finals; and [o:], [u], and [ɔ] have labialized dorsals as finals. This absence of short counterparts and the patterning with short vowels indicate that the three mid vowels [e:], [ə:], and [o:] are underlyingly short. In open syllables, however, these vowels are always long just like those in the Hanoi dialect.

Below, 12 provides a phonetic example for each occurrence in Table 11.

(12)  Examples of final consonantal rhymes in the Saigon dialect

| FRONT VOWELS | CENTRAL VOWELS | BACK VOWELS |
|---|---|---|
| a. [CVp] *tim* [tim] 'heart' | *cúm* [kim] 'flu' | *buồm* [bu:m] 'sail' |
| *kiếm* [ki:m] 'sword' | *bướm* [bi:m] 'butterfly' | *nhuộm* [ɲu:m] 'to dye' |
| *tiếp* [ti:p] 'to continue' | *cơm* [kə:m] 'cooked rice' | *tôm* [to:m] 'shrimp' |
| *đêm* [de:m] 'night' | *thắp /thấp* [tʰap] 'to light/be short' | *hộp* [ho:p] 'box' |
| *phép* [fɛ:p] 'permission' | *câm* [kam] 'mute' | *hợp* [hɔ:p] 'a meeting' |
| *nếp* [ne:p] 'sticky rice' | *lắn/lấn* [lam] 'much/dirty' |  |
| *thấp* [tʰa:p] 'tower' |  |  |
| b. [CVt] *ít/ ích* [ʔit] 'a little/ be useful' |  |  |
| *đít* [dik] 'be broken, cut' |  |  |
| *đến* [də:n] 'to arrive' |  |  |
| *lệnh* [lə:n] 'order' |  |  |
| *anh* [ʔan] 'older brother' |  |  |
| *khách* [xat] 'guest' |  |  |
| d. [CVk] *kiến* [ki:ŋ] 'ant' | *đức* [dik] 'virtue' | *buộc* [bu:k] 'to tie' |
| *điếc* [di:k] 'be deaf' | *ướt/uốc* [ɨ:t] 'be wet/to wish' | *chuột* [cu:t] 'rat, mouse' |

| | | |
|---|---|---|
| *xẻng* [se:ŋ] 'shovel' | *ớt* [ʔə:k] 'pepper' | *ngọt* [ŋɔ:k] 'be sweet' |
| *đen* [dɛ:ŋ] 'black' | *nấc* [nak] 'to hiccup' | *ngon* [ŋɔ:ŋ] 'be tasty' |
| | *mắ /mắc*[mak] 'eye/be expensive' | |
| | *đất* [dak] 'land, soil' | |
| | *khác* [xa:k] 'be different' | |

e. [CVkᵖ]                 *Úc* [ʔukᵖ] 'Australia'

                                        *đúng* [duŋ^w] 'to be correct'

                                        *tốt* [to:kᵖ] 'good, excellent'

                                        *một* [mo:kᵖ] 'one'

                                        *khóc* [xɔkᵖ] 'to cry'

                                        *ông/ong* [ɔŋ^w]

                                        'grandfather/ bee'

Table 12 provides the underlying vowels that occur before the final consonants. This table shows that there are two places of articulation in the Saigon dialect, labial /p/ and unspecified /C/. The unspecified place can be realized as a coronal, a plain velar, or a labiovelar. The discrepancies between Tables 11 and 12 are resolved below.

In Table 11 coronals occur in a limited distribution: only after the central vowels. In Table 12 coronals occur after three short front vowels, shown in shaded cells. Labial consonants do not occur after [u] and [ɔ] in Table 11, but they do so in Table 12. In Table 11 [e:], [ə:], and [o:] occur without short counterparts. In Table 12 these vowels occur underlyingly short and have no long counterparts. In Table 11 the central vowels [i:] and [a:] occur with a following dorsal and their short counterparts with either a following coronal or dorsal. Since dorsals occur after all other non-front long vowels, these vowels contrast in length as shown in Table 12. Table 12 also shows coronals and velars to be in complementary distribution: coronals occur only after the three short front vowels, and velars occur elsewhere.[4] As in the Hanoi dialect, labialized velars are allophones of plain velars because of their complementary distribution.

The following section will address two problems seen in Table 11. First, there

| | i | i: | e: | ɛ | ɛ: | i | i: | ə: | a | a: | u | u: | o: | ɔ | ɔ: |
|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| /p/ | [p] | + | + | + | + |   | + | + | + | + | + | + | + |   | + |
| C | [t] | + | + | + |   |   |   |   |   |   |   |   |   |   |   |
|   | [k] |   | + |   |   | + | + | + | + | + |   | + |   |   | + |
|   | [kᵖ] |   |   |   |   |   |   |   |   |   |   | + |   | + | + |

Table 12. Underlying vowel before final consonants in the Saigon dialect

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[4]Cao (1998:121) claims that coronals occur only after /i/ and /e/ but does not specify whether these vowels are long or short. Instead, he attributes the difference in length to the final consonants, i.e, [k] for a velar after a short vowel, [k:] for a plain velar after a long vowel, and [kᵖ] for a labialized velar after a back vowel. Cao states that labialized velars after back rounded vowels are long versions of the dorsals, and coronals after front vowels are the anteriorized version of dorsals. He simply claims that these versions result from occurrence after vowels with similar properties but offers no evidence in support.

are asymmetries between the short and long vowels before coronals and dorsals. Only dorsals follow long vowels; coronals do not. Secondly, labialized dorsals follow short back vowels, as in the Hanoi dialect. Coronals and dorsals follow central vowels; however, neither coronals nor dorsals may follow front vowels. It will show that short central vowels before coronals are underlyingly front vowels resulting from centralization, and that the SWC accounts for feature sharing between a short vowel and the final consonant: a coronal occurs only after short front vowel by sharing [coronal] with the vowel, but after a long vowel the consonant is not affected and only a velar can occur.

5.2. PROBLEMS WITH SHORT FRONT VOWELS AND SOLUTIONS. The Hanoi dialect showed an asymmetrical pattern of consonants after [a], i.e. only after this vowel do we find the full range of consonants. In the Saigon dialect there is a different asymmetry: only short central vowels have the full range of consonants (labial, coronal, and dorsal). Coronals or dorsals do not follow short front vowels. 13 provides examples of this asymmetry along with the orthography and the Hanoi pronunciation.

(13)   Asymmetry of front and central vowels in the Saigon dialect

|  | UR IN |  |  |  |
| ORTHOGRAPHY | HANOI | HANOI | SAIGON | GLOSS |
| --- | --- | --- | --- | --- |
| *ích* | /ʔik/ | [ʔiᶦk] | [ʔit] | 'be useful' |
| *ít* | /ʔit/ | [ʔit] | [ʔit] | 'a little' |
| *éch* | /ʔek/ | [ʔeᶦk] | [ʔəːt] | 'frog' |
| *ách* | /ʔɛk/ | [ʔaᶦk] | [ʔat] | 'yoke' |
| *tắc* | /tak/ | [tak] | [tak] | 'be plugged up' |
| *tắt* | /tat/ | [tat] | [tak] | 'to turn off' |

Two problems arise. Why do coronals and dorsals contrast only after central vowels? Why do coronals and dorsals fail to occur after short front vowels? Answers require an examination of the different distributions of labial finals and coronal and dorsal finals after vowels.

The simplest solution is to assume that Table 12 shows the underlying vowels. Coronals and dorsals disappear after /i/ and /e/ (which surface as long vowels) and central vowels have both following coronals and dorsals. However, a closer examination will show that the required phonemic vowel inventory is larger with centralization: because the surface central vowels before coronals are derived from underlying front vowels before surface coronals. The quantity and quality of the vowel specify the final consonant, not vice versa, a consequence of the SWC and centralization.

In the Hanoi dialect vowel quality and length interact to determine the realization of a dorsal as either a palatalized dorsal, a plain dorsal, or a labialized dorsal. In the Saigon dialect, vowel quality and length interact to produce still another effect on the rhymal consonants: they determine the realization of a final as either a coronal or a velar. A coronal results from spreading of [coronal] from the pre-

ceding front vowel; otherwise a default velar appears. Except for labials, only a single place of articulation is allowed postvocalically and it is realized as velar.

Had *ích* [ʔit] 'be useful' and *ức* [ʔik] 'to feel oppressed' been phonologically what they appear to be phonetically, i.e. /ʔit/ and /ʔik/, then the distribution of the consonants after front vowels appears to be unusual: coronal articulation is predictable after front vowels, dorsal articulation is predictable after back vowels, but coronals and dorsals contrast after central vowels. However, if the *ích* [ʔit] and *ức* [ʔik] patterns represent different vowels rather than different consonants, then the place of consonants is predictable. Specifically, if [it], as in *ích* [ʔit] 'be useful', is underlyingly /iC/ and [ik], as in *ức* [ʔik] 'to feel oppressed', is underlyingly /iC/, where C is a consonant that can be realized as [t], [k], or [kᵖ] depending on the quality of the preceding vowels, coronals and dorsals are in complementary distribution: coronals follow short front vowels and dorsals follow short non-front vowels, as in Table 13.

|  | VC | | |
| --- | --- | --- | --- |
|  | i | ɨ | u |
|  | e | ə | o |
|  | ɛ | a | ɔ |
| surface consonants | [t] | [k] | [kᵖ] |
| underlying consonant | C | C | C |

Table 13. Distribution of coronals and velars after underlying sort vowels

However, two further issues remain. What is the identity of the underlying /C/? Why are there no short front vowels before coronals on the surface?

The answers require an important distinction to be made between a dorsal and a velar (Rice 1996). A dorsal has a fullest place structure while a velar is a consonant that lacks a specified place feature in both its phonological and phonetic representations.

What, therefore, is /C/ above? If coronals and dorsals are in complementary distribution, which feature is phonetically conditioned and which feature is underlyingly specified for the finals? If a coronal is specified in the final position, what accounts for the surface distribution of plain dorsals after central vowels? If a dorsal final is specified in the Saigon dialect, why does a dorsal fail to occur as a palatal after receiving the feature [coronal] from the preceding short front vowel, as in the Hanoi dialect, where /ik/ becomes [ic] but is still realized as a labiovelar consonant after a short back vowel, as in [ukᵖ]?

If a consonant with no specified place of articulation is realized as a velar—a placeless node phonetically and phonemically—by phonetic interpretation as argued for in Rice (1996), then the placeless consonant in the Saigon dialect is realized as either a coronal or a velar. According to the SWC, the distribution of coronals and velars is predictable. The SWC states that since only consonants in light syllables are subject to feature sharing with the vowel, the distribution of coronals after short front vowels is explicable: because the vowel is short, the

syllable is light, and therefore the consonant receives the feature [coronal] from the front vowel and surfaces as a coronal. However, before coronals short front vowels are centralized. It may be that the surface constraint mentioned in 10 prohibits an adjacent vowel and consonant in the nucleus from having identical features. This constraint on shared features holds with all vowel heights in the Saigon dialect: consequently, the vowel is centralized. The underlying feature [coronal] of the front vowel is displaced onto the consonant.[5] The realization of a surface coronal together with the centralization of a front vowel in the Saigon dialect results from the placeless consonant shown in 14. Examples are given below.

(14) Realization of front vowels before a placeless consonant.

    a. Front vowel shares [coronal] with the unspecified consonant, the consonant surfaces as a coronal

        /iC/   →   [it]

    b. Centralization of the front vowel under the constraint in 10

| | *[it] | → | [it] | |
|---|---|---|---|---|
| *ích/ít* | /iC/ | → | [ʔit] | 'be useful/a little' |
| *éch* | /eC/ | → | [ʔəːt] | 'frog' |
| *khách* | /xɛC/ | → | [xat] | 'guest' |

However, although the centralization in the Saigon dialect is much stronger than in the Hanoi dialect for front vowels, it can be argued that it is still not a full centralization and should be treated as a phonetic-gradient process rather than the effect of the OCP in a rhyme with a short vowel and a consonant. In the absence of any reported perception study of centralization in the Saigon dialect, a personal investigation of the linguistic ability of a native speaker of this dialect suggested that he perceived no difference between underlying front and central vowels before coronals or velars. He was asked to produce two syllables *mít* [mit] 'jackfruit' and *mứt* [mik] 'jam' and then to judge the vowels in the syllables he had produced without thinking about the spelling, which gives different symbols for front and central

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[5]Cao (1998) acknowledges the centralization of the short /e/ before the Hanoi palatals, e.g. [eɲ], and of the long /eː/ before coronals, e.g. [eːn]; both occur as [əːn] in the Saigon dialect. His explanation is that because in these cases the vowels no longer contrast, the burden of contrast is placed on the finals: the Hanoi [eɲ] and [eːn] become the Saigon [əːn], and the Hanoi [əːn] becomes the Saigon [əːŋ]. First, there are no palatals, either underlying or surface, in the Southern dialects including that of Saigon. The comparison above is not sufficient. Second, he offers no explanation as to why high vowels are treated differently: both Hanoi [iɲ] and [in] neutralize to [in] in the Saigon dialect and both Hanoi [uŋᵐ] and [un] neutralize to Saigon [uŋᵐ].

In other words, why do the vowels behave differently in shifting the contrast burden to the consonant in order to simplify the final inventory in the Saigon dialect: /ɲ/ and /n/ become [n] after /i/, and [ŋ] after /u/, but remain distinct after /e/, i.e., [əːn] and [əːŋ]? The analysis in this paper offers an answer to this question by recognizing vowel length and that there is a placeless consonant in the final position. The SWC then determines whether a coronal or a velar surfaces after the vowel.

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vowels. He insisted that the two syllables contain exactly the same vowel and differ only in the final consonant. However, the vowels in the two syllables were not really the same in his production because the underlying vowel /i/ in [mit] was pronounced further forward than the underlying vowel /i/ in [mik]. It may have simply been a co-articulation effect since the vowel is further forward before a coronal and further back before a velar. Even though the speaker could not hear the slight difference between the vowels in *mít* [mit] 'jackfruit' and *mứt* [mik] 'jam' in his own production, there is such a difference. This test provides further support for the claim that [it] and [ik] are underlyingly different vowels, /iC/ and /iC/. (Because /i/ and /i/ are in complementary distribution in the Saigon dialect, i.e. /i/ before coronals and /i/ before velars, it is not possible to test whether they are phonetically the same.)

The centralization of /u/ before labials is also very strong, e.g. *túm* /tum/ 'to gather/tie' becomes [tim]. This process is discussed in detail below. Again, there is an accidental gap because the high central vowel does not occur before labials, so it is not possible to test whether the central and back vowels are pronounced the same in the same environment. If this is indeed not a full process then the OCP effect does not provide a very strong explanation here. The dissimilation process could be governed by the OCP or the phonetic realignment of the feature from the vowel onto the final consonant, as in the Hanoi dialect. However, the phonetic-gradient analysis has a further problem in that it is sensitive to syllable weight. Because speakers and listeners do not seem to recognize the gradient nature of the centralization, they opt for a categorical solution, i.e. the vowel is either front or central, rather than for something in between. Therefore, the OCP analysis provides a better account here.

With back vowels, the placeless consonant is realized as a velar through phonetic implementation (Rice 1996). This surface velar, which shares the rhyme with a short back vowel, receives [labial] from the vowel and surfaces as a labialized velar. The realization of a labialized consonant after a back vowel occurs in *Úc* /ʔuC/ 'Australia' → [ʔukᵖ]. This process is similar to the palatalization of a dorsal after a front vowel in the Hanoi dialect discussed earlier. Because central vowels do not have features to give, a placeless consonant after a short central vowel is realized as a plain velar, as in *ức* /ʔiC/ 'to feel oppressed' [ʔik]. After a long vowel, the consonant is outside the nucleus, feature spreading does not occur, and the placeless consonant surfaces as a plain velar, as in *điếc* /diːC/ 'be deaf' [diːk].

In summary only [labial] and an unspecified final place of articulation are allowed in the Saigon dialect. For the unspecified place, a bare place node becomes a plain velar by interpretation after central or long vowels and diphthongs, a labiovelar after short back vowels, and a coronal after short front vowels.[6] The use of a placeless consonant provides a simple account for both the phonetic and

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[6]Rice (1996:513) uses the Saigon dialect as an example of a language with three places of articulation historically licensed in a rhyme. However, due to the inaccessibility of data and sources in Vietnamese, she was able to account for the full distribution of labial, unspecified, and dorsal only after the short vowel /a/. She suggests that historically three

phonological distributions of finals after central vowels. This situation is quite different from the Hanoi dialect, where both coronal and dorsal occur.

So far as labial consonants are concerned, Table 11 shows that labials occur after all vowels except the short vowels [ɔ] and [u]. The gap with labials after short [u] and the occurrence of labials after short [i] are unusual, because where length is phonetically contrastive, short vowels always have following labials but long vowels may or may not, and the gap with labials after [i] is accidental in all dialects. If labials do occur after [u], which is also underlying /u/, the SWC accounts for the centralization of /u/ before labials as follows: because the back vowel is short, the labial consonant is in a light rhyme and thus violates the constraint on a shared feature, here the sharing of Labial. This is an OCP effect. The vowel, therefore, is centralized as in *cúm* /kum/ 'flu' [kɨm].

Here, unlike the case in which the surface constraint does not allow feature sharing between a vowel and a placeless consonant, both the vowel and consonant are specified for the same feature [labial], a feature that is also disallowed in the rhyme of light syllables. The centralizations with /i/ and /u/ are not identical since /i/ gives its feature to the consonant but /u/ requires delinking rather than spreading. Centralization with back vowels occurs not only within the light syllable but also optionally within the heavy syllable: a long vowel /uː/ is centralized and surfaces as [ɨː] before labials, as in *buồm* /buːm/ 'sail' [bɨːm].[7]

Two alternative solutions must be considered. First, it can be argued that the absence of both [coronal] and [dorsal] after front vowels in the Saigon dialect is a gap which is either accidental or a consequence of a sound change. This is the simplest explanation. However, it would not explain why certain patterns are never found in any dialect of Vietnamese: for example, coronals and dorsals contrast after back vowels but not after front and central vowels, or after front vowels but not after central and back vowels. Moreover, the fact that both Hanoi *ích* [iᵏk] and *ít* [it] are pronounced as [ʔit] in the Saigon dialect suggests that there is a merger of [coronal] and [dorsal] in the Saigon dialect. The limited distribution of coronal suggests that [coronal] has been lost, not the dorsal. If that is the case then it is

places are licensed in the Saigon dialect but the dialect is moving toward simplification as shown by the disappearance of dorsal and the failure of coronal default, and she treats the unexpected distribution of consonants after /a/ as an exception. This paper supports Rice's claim that there are just two such places in the Saigon dialect, but extends it by using the SWC to explain the centralization in all front vowels and to argue that the surface form of the unspecified consonant in the Saigon dialect depends on the quality and quantity of the preceding vowel through feature sharing and centralization. The exceptional distribution of consonants after [a] follows from the centralization of the low front vowel, as seen in non-low front vowel in the Saigon dialect.

[7]This /uː/ corresponds to the back diphthong /uə/ in the Hanoi dialect. Because of the lack of [iː] and [uː] before historical coronals in Nam Bo (southern) dialects, Cao (1988) argues that the historical diphthongs /iə, uə/ fill these gaps. This solution introduces one more glide, /ʅ/, in the final position and agrees with the one proposed above.

more likely that [coronal] was lost after all vowels rather than after only front and back vowels.

The other possibility is to assume that there is a placeless consonant and central vowels are specified for [dorsal]. The front vowel spreads [coronal] with [+anterior] inserted as default resulting in a coronal, the central vowel spreads [dorsal] creating a plain velar, and the back rounded vowel spreads [labial] resulting in a labiovelar. However, as shown earlier, both front vowels and back vowels have a tendency to move toward the central area, i.e. front vowels before dorsals in the Hanoi dialect and /u/ before labials in the Saigon dialect, and this tendency is strong enough to affect the surface form of the following consonant, e.g. palatals in the Hanoi dialect. Central vowels tend to be the NEUTRALIZED position for both front and back vowels so it is likely that central vowels are also not specified for [dorsal].[8]

In conclusion, the distribution of coronals and velars in the Saigon dialect is best accounted for on the assumption that there is only one non-labial final place of articulation, namely unspecified. The SWC accounts for the realization of the placeless consonant: it is realized as a coronal after a short front vowel and as a type of velar elsewhere, as summarized below in Table 14. Again, as in the Hanoi dialect, in order for a consonant to receive features from a vowel or for a vowel to become centralized, the vowel and the rhymal consonant must be in a non-branching nucleus.

| | VC | | | V:C | | |
|---|---|---|---|---|---|---|
| | i | ɨ | u | iː | ɨː | uː |
| | e | ə | o | | | |
| | ɛ | a | ɔ | ɛ | a | ɔ |
| underlying final | C | C | C | C | C | C |
| feature sharing | [cor] | | [lab] | | | |
| surface consonants | [t] | [k] | [kᵖ] | [k] | [k] | [k] |

Table 14. Phonetic realization of a final consonant in the Saigon dialect

15 provides underlying representations for all the phonetic examples given in 11. It also shows both the phonetic and phonemic representations of each rhymal type by place of articulation of the final consonant. Manner is also shown in the phonemic form of each item, i.e. 'N' for a nasal and the final 'C' for a stop, which is a coronal after short front vowels and a velar elsewhere.

[8]The unusual distribution of coronal and velar finals is also mentioned in Seitz (1986); however, he provides a different analysis. He claims that velars after non-front vowels in South Vietnamese result from [+back] spreading in back vowels and that coronals occur after non-back vowels. However, this claim cannot account for the different phonological behaviors of central vowels and back vowels. Furthermore, Seitz claims that [+back] spreading also occurs in North Vietnamese when velars are labialized. If so, this account is unable to explain why both coronals and velars appear after all vowels in the Hanoi dialect. It must be noted though that this is not a major issue in Seitz's work.

(15)   Underlying forms of consonantal rhymes in the Saigon dialect

| FRONT VOWELS | CENTRAL VOWELS | BACK VOWELS |
|---|---|---|

a. [CVp]

/CVp/   *tim* /tim/ 'heart'   *bướm* /bi:m/ 'butterfly'   *cúm* /kum/ 'flu'
*đêm* /dem/ 'night'   *cơm* /kə:m/ 'cooked rice'   *nhuộm* /ʃu:m/ 'to dye'
*nếp* /nep/ 'sticky rice'   *thấp/thắp* /tʰap/ 'to light/be short'   *buồm* /bu:m/ 'sail'
*phép* /fep/ 'permission'   *câm* /kam/ 'mute'   *tôm* /tom/ 'shrimp'
*kiếm* /ki:m/ 'sword'   *lẫn/lắm* /lam/ 'much/dirty'   *hộp* /hop/ 'box'
*tiếp* /ti:p/ 'to continue'   *tháp* /tʰa:p/ 'tower'   *hợp* /hɔp/ 'a meeting'

b. [CVt]

/CVC/   *tí /tch* /tiC/ 'a little/be useful'
*đến* /deN/ 'to arrive'
*lệnh* /leN/ 'order'
*anh* /ʔeN/ 'older brother'
*khách* /xeC/ 'guest'

d. [CVk]

/CVC/   *kiến* /ki:N/ 'ant'   *đức/đứt* /diC/ 'virtue/ be broken, cut'   *buộc* /bu:C/ 'to tie'
*điếc* /di:C/ 'be deaf'   *ướt/ước* /ʔi:C/ 'be wet/to wish'   *chuột* /cu:C/ 'rat, mouse'
*kín* / /kiN/ 'tight, fully covered'   *ớt/ʔəC/ 'pepper'   *ngọt* /ŋɔ:C/ 'be sweet'
*đen* /de:N/ 'black'   *nấc* /naC/ 'to hiccup'   *ngon* /ŋɔ:N/ 'be tasty'
*sẻng* /se:N/ 'shovel'   *khắc* /xaC/ 'to engrave'
*hét* /he:C/ 'to scream, yell'   *đất* /daC/ 'land, soil'
*mắt /mắc* /maC/ 'eye/be expensive'
*khác* /xa:C/ 'be different'

e. [CVkᵖ]
/CVC/   *Úc* /ʔukC/ 'Australia'
*đúng* /duN/ 'to be correct'
*tốt* /toC/ 'good, excellent'
*một* /moC/ 'one'
*khóc* /xɔC/ 'to cry'
*ông/ong* /ɔN/ 'grandfather/bee'

Section 2 showed that the Hanoi dialect has all three places of articulation in the rhyme: Labial, Coronal, and Dorsal. However, instead of Coronal being specified there is actually a placeless consonant, just as there is in the Saigon dialect. According to the DVH, this unspecified place is realized as a coronal from Default fill-in. The phonemic distribution of final consonants in the Hanoi dialect can be reanalyzed as in Table 15 with labials excluded. The unspecified place, represented as 'C', surfaces as a coronal after all vowels by Default. The specified [dorsal] surfaces as a palatalized dorsal after a front vowel, as a plain dorsal after a short central vowel, long vowel or diphthong, and as a labialized dorsal after a short back vowel.

| | VC | | | V:C | | |
|---|---|---|---|---|---|---|
| | i | ɨ | u | | ə | |
| | e | ə | o | | | |
| | ɛ | a | | ɛ: | a: | |
| | | | | iə | iə | uə |
| underlying final | C/k | C/k | C/k | C/k | C/k | C/k |
| feature sharing | [cor] | | [lab] | | | |
| surface consonant | t/c | t/k | t/kᵖ | t/k | t/k | t/k |

Table 15. Phonemic distribution of final consonants in the Hanoi rhyme

This analysis using a placeless consonant provides a unified treatment for all Vietnamese dialects, and conforms to patterns found in many other languages (see Rice 1996).

6. SUMMARY AND CONCLUSION. This paper describes the rhymal system in the Hanoi and Saigon dialects and argues that there is an unspecified place in all Vietnamese dialects.

In the Hanoi dialect three places of articulation are licensed: labial, unspecified, and dorsal. In the Saigon dialect there are only two places of articulation: labial and unspecified. The unspecified place is filled in by Coronal Default, which creates coronal consonants in the Hanoi dialect. However, in the Saigon dialect Coronal Default fails and the unspecified place is realized by a coronal after short front vowels by Coronal Spreading; otherwise, a velar occurs by Implementation.

The underlying inventory and the surface representations of final consonants in the two dialects are summarized in Table 16. The first column names the dialects. The second column presents the underlying inventory by place of articulation. The third column refers to the implementation of Coronal Default. The fourth column presents the surface realizations of the unspecified consonant and the dorsal consonant. The fifth column shows the centralized vowels in each dialect with the parentheses indicating that the vowel is optionally centralized.

| | UNDERLYING PLACES OF ARTICULATION | CORONAL DEFAULT | COMPLEMENTARY DISTRIBUTION | CENTRALIZATION |
|---|---|---|---|---|
| HANOI | labial, unspecified, dorsal | yes | 'k': c ~ k ~ kᵖ /C/: t | ɛ > a (before palatalized dorsals) |
| SAIGON | labial, unspecified | no | /C/: t ~ k ~ kᵖ | i > ɨ, e > ə:, ɛ > a (before coronals) u > ɨ, (u:) > (i:) (before labials) |

Table 16. Representation of consonantal place of articulation in Vietnamese

Table 16 shows that the differences among the dialects lie partially in the underlying inventory of place of articulation. Coronal Implementation is also dialect-

particular: Coronal Default occurs in the Hanoi dialect but not in the Saigon dialect. Ghini (1995) argues that in Genovese Ligurian the failure of Coronal Implementation leads to the interpretation of the bare place node as a velar. In the Saigon dialect, however, the failure of Coronal Implementation does not lead to a surface velar after all vowels. Instead, after short front vowels, final coronals surface from the preceding vowel through Coronal Spreading. Therefore, in Vietnamese dialects surface coronals arise from two different sources: either from Coronal Implementation, as in the Hanoi dialect, or from Coronal Spreading, as in the Saigon dialect.

The differences between dialects shown in Table 16 reveal a tendency toward simplification in the underlying inventory of final consonants: consonants tend to be less marked in codas. However, other aspects of Saigon phonology show greater complexity than the Hanoi dialect, e.g. /ʈ, ʂ, r/ in initial position do not occur in the Hanoi dialect.

Finally, a rhymal placeless consonant in Vietnamese is realized as either a coronal or a velar under the Syllable Weight Constraint and the Default Variability Hypothesis (DVH).

A surface coronal results either from Coronal Implementation as in the Hanoi dialect, or from Coronal Spreading, as in the Saigon dialect. The latter occurs under a prosodic condition, the SWC: only a short front vowel can give a feature to a consonant but a long front vowel can not. When Coronal Default fails or the prosodic requirement is not met, a bare node is realized as a velar. The SWC also applies: if the back vowel is short, it gives the feature [labial] to the consonant, which is realized as a labialized velar. If the back vowel is long or if it is a placeless vowel, i.e. a central vowel, the bare node surfaces as a plain velar. The SWC also applies to the final consonant when it is specified as either [labial] as in centralization in the Saigon dialect, or [dorsal] as in palatalization and labialization in the Hanoi dialect.

This paper provides not only an explanation of the distribution of final consonants in the Saigon dialect but also offers an account of certain phenomena such as centralization in the various vowel inventories. In addition, it presents extensive evidence for the claim that the relationship between coronals and velars is a very close one.

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