



THE PHONOLOGY OF WORDS WITH MONOSYLLABIC STEMS IN MALAY

FONOLOGI PERKATAAN YANG BERKATA AKAR SATU SUKU KATA DALAM BAHASA MELAYU

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Abstract

It is generally observed that when monosyllabic stems undergo the process of affixation with verbal prefixes /mən-/ and /di-/ in Malay, two phonological alternations surface in the output forms, namely vowel lengthening (i.e. /di-pam/ → [di:pam] ‘to pump (passive)’), and schwa epenthesis (i.e. /mən-pam/ → [məŋəpam] ‘to pump (active)’). Unlike the later, the former has not been well examined and accounted for in the previous studies, and therefore the analyses missed some important generalizations about the phonology of the so-called monosyllabic stems in Malay. Previous studies suggested that the so-called monosyllabic stems are lexically disyllabic with an initial empty V-slot at the CV tier. This representation is in agreement with the basic prosodic structure of the words in the language which is normally disyllabic. This empty V-slot triggers the application of vowel lengthening and schwa epenthesis rules, and simultaneously blocks the application of visibly active rules such as nasal assimilation, nasal deletion and nasal substitution. However, based on additional data generated from DBP corpus, it is apparent that there are monosyllabic stems that do not undergo schwa epenthesis as predicted by the rule (i.e. /mən-gam/ → [məŋgam] ‘to glue’). This demonstrates that the previous analysis is inadequate and over generalized. The present study concurs that the so-called monosyllabic stems are lexically disyllabic but with an initial empty mora. In the process of syllabification, the empty mora in the rhyme can be linked either with a preceding vowel, an epenthetic schwa or a homorganic nasal.

Keywords: monosyllabic, mora, schwa epenthesis, syllabification, vowel lengthening

Abstrak

Dalam bahasa Melayu, apabila kata akar yang bersuku kata satu menjalani proses pengimbuhan dengan awalan kata kerja /mən-/ dan /di-/, secara umumnya dua alternasi fonologi didapati muncul pada bentuk output di peringkat permukaan, iaitu pemanjangan vokal (i.e. /di-pam/ → [di:pam] ‘dipam (pasif)’), dan penyisipan vokal (i.e. /mən-pam/ → [məŋəpam] ‘mengepam (aktif)’). Berbeza dengan fenomena yang kedua, fenomena pertama itu tidak pernah diteliti dan dijelaskan dalam kajian-kajian lepas, justeru analisis yang dikemukakan gagal memberikan satu generalisasi yang menyeluruh tentang perilaku fonologi kata akar yang bersuku kata satu dalam bahasa Melayu. Kajian lepas menyatakan bahawa kata akar yang bersuku kata satu itu adalah bersuku kata dua di peringkat representasi leksikalnya, iaitu wujudnya gatra V kosong di tingkat KV. Representasi ini bertepatan dengan struktur prosodi kata dasar bahasa Melayu yang umumnya bersuku kata dua. Gatra V

kosong ini mendorong pelaksanaan rumus pemanjangan vokal dan penyisipan vokal, dan pada masa yang sama menghalang pelaksanaan rumus asimilasi nasal, pengguguran nasal dan penggantian nasal. Namun, berdasarkan data tambahan yang dijana daripada data korpus DBP, terdapat kata akar yang bersuku kata satu yang tidak menjalani rumus penyisipan vokal seperti yang dijangkakan (i.e. /mən-gam/ → [məŋgam] ‘menggam’). Ini menunjukkan bahawa analisis lampau tidak berpada dan telah membuat satu generalisasi yang berlebihan. Kajian ini sebaliknya mendakwa bahawa kata akar yang bersuku kata satu itu adalah bersuku kata dua dengan wujudnya mora kosong di peringkat leksikalnya. Dalam proses penyukuan kata, mora kosong di posisi rima ini boleh dihubungkan sama ada dengan bunyi vokal sebelumnya, vokal schwa ataupun konsonan nasal yang homorgan.

Kata kunci: suku kata tunggal, mora, epentesis schwa, penyukuan kata, pemanjangan vokal

INTRODUCTION

Affixation is one of the most productive word formation processes in Malay. The affixes are classified into four main types, namely prefixation, suffixation, infixation and circumfixation. Among the affixes, the active verb forming prefix /məŋ-/ and the passive verb forming prefix /di-/ are the most productive one, and they can be concatenated with verbal, nominal and adjectival stems.

In the phonological domain, the concatenations of prefix /məŋ-/ and /di-/ with all categories of stems trigger different types of rules depending on these two phonological facts: (i) the syllable structure of the stems, either polysyllabic or monosyllabic, and (ii) the initial segments of the stems. The phonology of /məŋ-/ regulates four types of regular rules, namely nasal assimilation, nasal substitution, nasal deletion and schwa epenthesis, whereas the phonology of /di-/ involves glottal insertion and vowel lengthening.

STATEMENT OF THE PROBLEM

It has been generally accepted that the prefix /məŋ-/ surfaces in the output as [mə], [məm], [məŋ], [məŋ], [məŋ], and [məŋə] which are in complementary distribution and phonologically conditioned (Farid 1980, Yeoh 1988, Teoh 1994, Nik Safiah et.al 1989, Asmah 1986). Their distribution is determined by two phonological facts – (i) the syllable structure of the stems, and (ii) the initial consonant of the stems. Except for [məŋə], all the alternants occur with polysyllabic stems, and the occurrence of each form is conditioned by the initial consonant of the stems. As claimed by many grammarians, the alternant [məŋə] only occurs with monosyllabic stems (Yeoh 1988, Teoh 1994, Nik Safiah et.al 1989, Asmah 1986). This claim seems to be superfluous because based on the data generated from the DBP corpus there are monosyllabic stems that occur with [məŋ]. In certain cases both variants are used interchangeably as free variations. This phonological phenomenon has not been adequately accounted for in the previous works.

In the case of prefix /di-/, it surfaces in three different forms, namely [di], [diʔ] and [di:] which are also phonologically conditioned. Their distribution is determined by the similar phonological facts that is (i) the syllable structure of the stems, and (ii) the initial segment of the stems. Unlike the latter, the former has not been well examined and accounted

for in the previous work. Thus, this paper attempts to offer an account to solve these two phonological issues.

PREFIXATION OF /məŋ-/ AND /di-/ WITH DISYLLABIC STEMS

As mentioned, the prefix /məŋ-/ has five variants and the prefix /di-/ has three in which their occurrences are phonologically governed. The concatenation of /məŋ-/ with polysyllabic stems triggers the application of three general phonological rules in the language, namely nasal assimilation, nasal substitution, and nasal deletion, and the prefixation with /di-/ produces a glottal insertion rule. To begin with, let us examine the examples listed below.

1. Prefixation of /məŋ-/ and /di-/ with polysyllabic stems

A

| Input | Active form | Passive form | Glos |
|----------|----------------|---------------|--------------|
| /basuh/ | [məm.ba.soh] | [di.ba.soh] | 'to wash' |
| /dapat/ | [mən.da.pat] | [di.da.pat] | 'to get' |
| /gali/ | [məŋ.ga.li] | [di.ga.li] | 'to dig' |
| /pəlawə/ | [məm.pə.la.wə] | [di.pə.la.wə] | 'to invite' |
| /tərnək/ | [mən.tər.naʔ] | [di.tər.naʔ] | 'to rear' |
| /kadʒi/ | [məŋ.ka.dʒi] | [di.ka.dʒi] | 'to study' |
| /haləŋ/ | [məŋ.ha.ləŋ] | [di.ha.ləŋ] | 'to prevent' |

B

| | | | |
|----------|--------------|--------------|--------------|
| /pakai/ | [mə.ma.kaj] | [di.pa.kaj] | 'to wear' |
| /taŋkap/ | [mə.naŋ.kap] | [di.taŋ.kap] | 'to catch' |
| /katʃau/ | [mə.ŋa.tʃaw] | [di.ka.tʃaw] | 'to disturb' |
| /sokoŋ/ | [mə.ŋo.koŋ] | [di.so.koŋ] | 'to support' |

C.

| | | | |
|------------|----------------|----------------|--------------|
| /masak/ | [mə.ma.saʔ] | [di.ma.saʔ] | 'to cook' |
| /nanti/ | [mə.nan.ti] | [di.nan.ti] | 'to wait' |
| /ŋaŋi+kan/ | [mə.ŋa.ŋi.kan] | [di.ŋa.ŋi.kan] | 'to sing' |
| /ŋəri+kan/ | [mə.ŋə.ri.kan] | [di.ŋə.ri.kan] | 'to terrify' |
| /lompat/ | [mə.lom.pat] | [di.lom.pat] | 'to jump' |
| /rompak/ | [mə.rom.paʔ] | [di.rom.paʔ] | 'to rob' |

D

| | | | |
|--------|-------------|-------------|--------------|
| /asah/ | [mə.ŋa.sah] | [di.ʔa.sah] | 'to sharpen' |
| /ikut/ | [mə.ŋi.kot] | [di.ʔi.kot] | 'to follow' |
| /ubah/ | [mə.ŋu.bah] | [di.ʔu.bah] | 'to alter' |
| /elak/ | [mə.ŋe.laʔ] | [di.ʔe.laʔ] | 'to avoid' |
| /olah/ | [mə.ŋo.lah] | [di.ʔo.lah] | 'to set out' |

As can be seen in the given examples, the initial consonant of the stem plays an important role in determining the application of three visibly active phonological rules in the active forms, that is nasal assimilation, nasal substitution and nasal deletion. In nasal assimilation, the final nasal of the active prefix /məŋ-/ assimilates to a place of articulation of a following obstruent. However, as can be seen in (1A), a laryngeal fricative /h/ initial stem occurs with the [məŋ] alternant. Based on a language specific rule, this cluster is regarded homorganic in this study. In nasal substitution rule, the initial voiceless obstruent of the stem is replaced by a homorganic nasal (1B). It must be noted that there is a few cases where initial voiceless obstruent stems do not undergo this rule (in 1A), and they are treated as exceptions. In nasal deletion rule, the final nasal is deleted when the following segments are sonorant consonants (1C). In the passive forms, a glottal stop is inserted intervocally (1D).

PREFIXATION OF /məŋ-/ AND /di-/ WITH MONOSYLLABIC STEMS

The above general rules, however do not active in the context of prefixation with monosyllabic stems. Some of the examples are as follows:

2. Prefixation of /məŋ-/ and /di-/ with monosyllabic stems

A.

| Input | Active form | Passive form | Glos |
|-----------|-----------------|-----------------|-------------------|
| /pam/ | [mə.ŋə.pam] | [di : .pam] | 'to pump' |
| /pos/ | [mə.ŋə.pos] | [di : .pos] | 'to post' |
| /bom/ | [mə.ŋə.bom] | [di : .bom] | 'to bomb' |
| /tin/ | [mə.ŋə.tin] | [di : .tin] | 'to put in a tin' |
| /sah+kan/ | [mə.ŋə.sah.kan] | [di : .sah.kan] | 'to verify' |
| /lap/ | [mə.ŋə.lap] | [di : .lap] | 'to wipe' |
| /mop/ | [mə.ŋə.mop] | [di : .mop] | 'to mope' |

B.

| | | | |
|-----------|---------------|-----------------|--------------|
| /gam/ | [məŋ.gam] | [di : .gam] | ‘to glue’ |
| /xas+kan/ | [məŋ.xas.kan] | [di : .xas.kan] | ‘to exclude’ |
| /had+kan/ | [məŋ.had.kan] | [di : .had.kan] | ‘to limit’ |
| /hos+kan/ | [məŋ.hos.kan] | [di : .hos.kan] | ‘to host’ |
| /kod/ | [məŋ.kod] | [di : .kod] | ‘to codify’ |

As can be seen, regardless what type of consonant occurs in the initial position, the active forms with monosyllabic stems will undergo the rule of schwa epenthesis, whereas the passive forms undergo the rule of vowel lengthening (2A). It must be noted that unlike the former, the latter has not been well studied. This is mainly because vowel quality (i.e long vowel versus short vowel) is not phonemic in the language. Thus it is not represented in the writing system. However, in a careful speech, the occurrence of long vowel in the passive forms is perceptible.

In the previous work, the data of active forms in (2B) are regarded incorrect and ungrammatical by some grammarians because their formations are not in agreement with the general rule of schwa epenthesis (Nik Safiah et.al 1989, Asmah 1986, Asraf 1990, Hashim 1993). They affirm that the correct outputs for the data in 2B are [məŋəgam], [məŋəxaskan], [məŋəhadkan], and [məŋəkod].

However, based on the contemporary data of five million words of the DBP corpus, it is evident that morphological words in (2B) are also used in the language. In other words, both forms either with [məŋ-] or [məŋə-] do occur and their distribution seems to be in free variations. The generalization that can be observed here is that if the initial consonants of the monosyllabic stem are dorsal segments (ie. /g, x, k, h/) then the rule of schwa epenthesis optionally fails to apply. In order to capture the natural class of those segments, the laryngeal fricative /h/ is treated as a dorsal segment in the present study. Samples of concordances generated from the DBP corpus are shown in (3) and the total number of words occurrences are listed in (4) .

3. Concordances generated from the DBP corpus

- 1 rperingkat. Maksudnya, kita boleh *****menghadkan***** kuota pemain import untuk musim aka
- 2 Stesen televisyen tempatan mula *****menghadkan***** pembelian drama tempatan sejak Janu
- 3 GAN sederhana pada sesi tengah hari *****menghadkan***** kejatuhan di Bursa Saham Kuala Lump
- 4 undang-undang yang mencengkam serta *****menghadkan***** hak asasi manusia dan mengiktiraf

- 5 i enam bulan kepada tiga bulan dan *****menghadkan***** pertumbuhan kredit
Kepada 25 perat
- 1 oduk bermutu, tetapi masalah modal *****mengehadkan***** peluang mereka untuk berkembang,"
- 2 n, berkata mereka tidak seharusnya *****mengehadkan***** peluang kerjaya dengan memilih bid
- 3 ng tiada unsur perjudian, termasuk *****mengehadkan***** pengeluaran permit bagi memudahkan
- 4 na cawangan Hong Kong. Dasar itu *****mengehadkan***** jumlah anak yang boleh dipelihara,
5. Mazlan Hashim berkata, Kemas perlu *****mengehadkan***** penggunaan balai raya dan bangunan

4. Words with monosyllabic stems and their occurrences

| | |
|------------------|-----------------|
| mengehadkan (71) | menghadkan (48) |
| mengegam (0) | menggam (1) |
| mengekhaskan (0) | mengkaskan (1) |
| mengekod (2) | mengkod (3) |

PREVIOUS ANALYSES

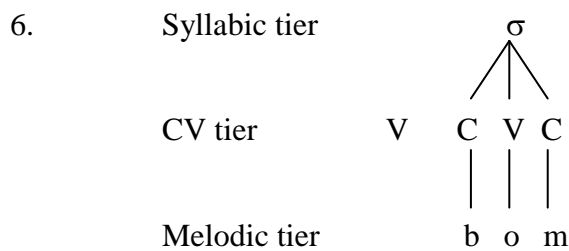
In Yeoh's analysis (1988) the epenthesis rule is conditioned by the syllable structure of the stems, and the rule is formalized in terms of SPE format as in (5). This rule must precede the nasal assimilation rule, the nasal substitution rule and the nasal deletion rule in bleeding order relationship in the derivation.

$$5. \quad \emptyset \rightarrow V / C + ____ + C V C \#$$

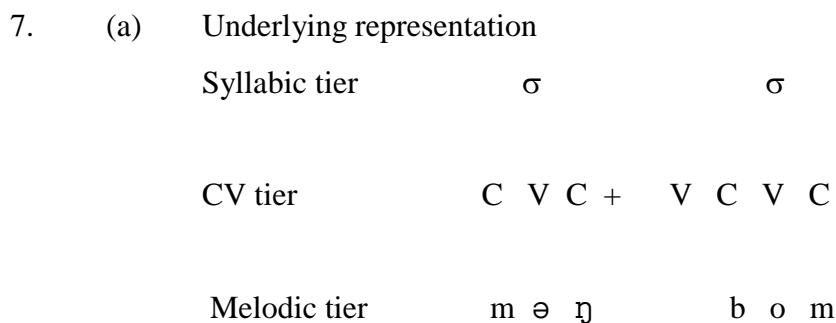
$$\left[\begin{array}{c} +\text{mid} \\ -\text{low} \end{array} \right] \left[\begin{array}{c} +\text{nasal} \\ -\text{anterior} \\ -\text{coronal} \end{array} \right]$$

The rule states that the vowel schwa is inserted between the velar nasal /ŋ/ and the monosyllabic stem. Based on the structural description given in (5), the rule predicts that all monosyllabic stems will undergo the rule of schwa epenthesis. This is evidently incorrect because as shown in (2B) there is a group of monosyllabic stems which does not undergo the rule.

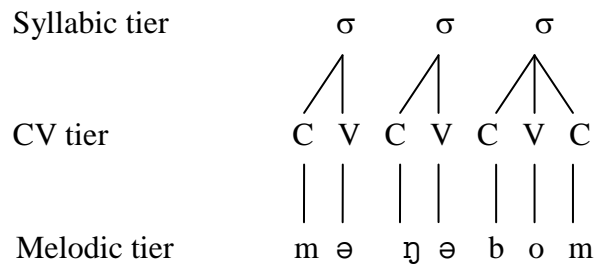
With the advent of non-linear phonology, Teoh (1994) and Zaharani (2000) propose an alternative analysis. Both of them agree that the motivation of applying the epenthesis rule to monosyllabic stems is an attempt on the part of the grammar towards remaking them disyllabic. It must be noted that most of the native stems are generally disyllabic. Monosyllabic stems are very rare and most of them are lexically borrowed. With that observation it is assumed that the prosodic structure of Malay stems is a foot (Teoh 1994, Zaharani 2000). It must be pointed out that in Teoh's (1994) analysis, the skeletal template of the stem is CVCVC with empty C-slot and V-slot in the first syllable. Whereas in Zaharani (2000) the representation is VCVC. The difference, however, is not significant because it is the V-slot that triggers the rule of schwa epenthesis. For the present purposes, the paper only discusses the analysis proposed by Zaharani (2000). In agreement with this assumption, the so-called monosyllabic stems in Malay are lexically diasyllabic with an empty initial V-slot in the underlying representation as illustrated in (6) below.



It is possible to find cases in which the V-slot remains unassociated, but it shows its presence by interacting with phonological rules sensitive to the organization of the CV tier. In French, for instance, the so-called 'h-aspire' words are having a similar structure to the form given in (6), except that the initial segment begins with a C-slot (Goldsmith 1990). When the monosyllabic stems are attached to the active prefix marker /mənɲ/, the derived form will have the structural representation as in (7a) below. The rule of nasal assimilation, nasal substitution and nasal deletion are inapplicable in this environment can be understood from the structure given. A monosyllabic stem with an unassociated V-slot will not trigger the rules because there is a V-slot intervenes between the C-slot of the nasal prefix and the C-slot of the stem. The structural descriptions of nasal assimilation, nasal substitution and nasal deletion require the nasal segment to be adjacent with the initial consonant of the stems (Teoh 1994). The following derivation illustrates the point we just made.

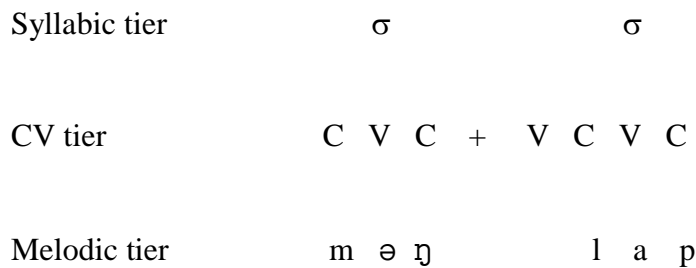


(b) Syllabification and schwa epenthesis

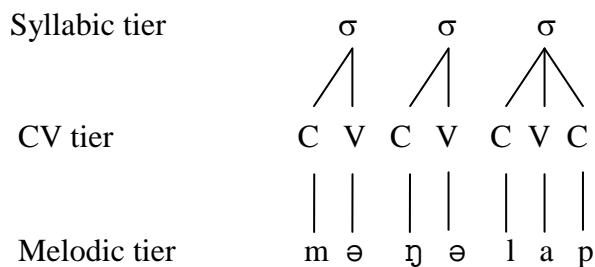


As mentioned, either the rule of nasal assimilation or the rule of nasal substitution fails to apply here since its structural description is not fully met. The nasal segment is then resyllabified into the onset of the following syllable, motivated by the minimal onset satisfaction principle (Roca 1994). The empty V-slot cannot be filled by spreading of any existing vowels since it will result crossing of association lines, a fatal violation of WFC. In order to be phonetically realized, the V-slot has to be furnished with an epenthetic vowel. In the case of Malay, the epenthetic vowel is a schwa. Similarly, the rule of nasal deletion fails to apply because the V-slot blocks its application.

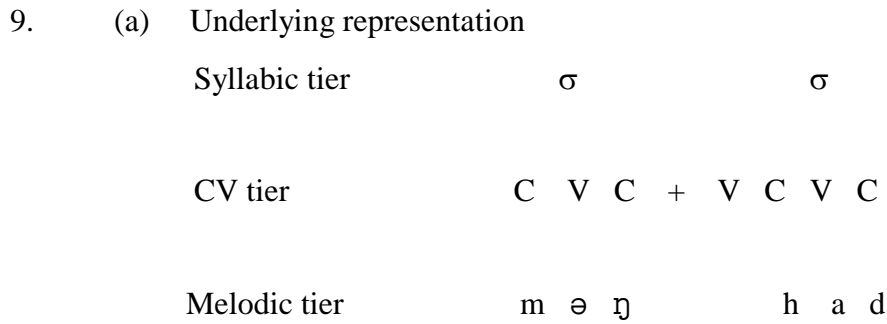
8. (a) Underlying representation



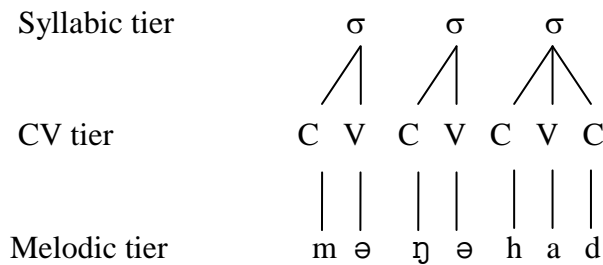
(b) Syllabification and schwa epenthesis



The derivations given in (7) and (8) are successful in generating correct surface outputs and adequately explain the inapplicability of nasal assimilation, nasal substitution and nasal deletion rules. This analysis, however fails to account for the data given in (2B) as the following derivation shows.



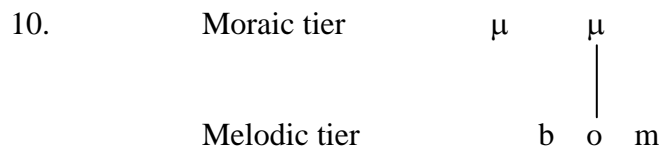
(b) Syllabification and schwa epenthesis



Given the same phonological motivations, the empty V-slot triggers the application of schwa epenthesis and resyllabification rules. The derivation can visibly handle the formation of [mənəhad] but fails to account for the formation of [mənŋhad] variant. In sum, the non-linear analysis of the CV model is unsuccessful in accounting for the inapplicability of schwa epenthesis rule in the latter case.

ANALYSIS OF THE MORAIC MODEL

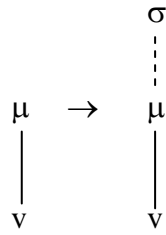
Following Teoh (1994) and Zaharani (2000), the present analysis presumes that the so-called monosyllabic stems are lexically disyllabic. However, at the skeletal tier the segment is represented by moras instead of CV slots. Under the moraic analysis, the lexical representation of the so-called monosyllabic stem in Malay is represented as in (10) below.



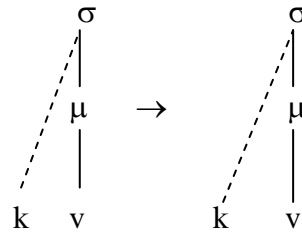
As can be seen, the representation is closely similar to the CV model where the first mora is an empty mora whereas the second mora is prelinked with the vowel of the stem. It is assumed that only vowels in the language have underlying moras while the consonant in the coda position gets its mora through weight by position rule (Hayes 1989). Before we offer an account to the issue of schwa epenthesis rule, we will begin by giving an overview about the syllable structure and the syllabification procedures operating in the language.

It has long been claimed that the basic structure of the Malay syllable is (C)V(C) (Abdullah 1974, Yunus 1980, Farid 1980, Zaharani 2005). Typologically, this language belongs to a class of languages which Clements and Keyser (1983) refer to as a type IV group that has four basic syllable structures, namely V, VC, CV and CVC. Following Teoh (1994), we posit that Malay basic syllable structures are produced by an ordered series of three syllable building rules, namely (i) a nucleus building rule, (ii) an onset building rule, and (iii) a coda building rule, which can be formalised as in (11).

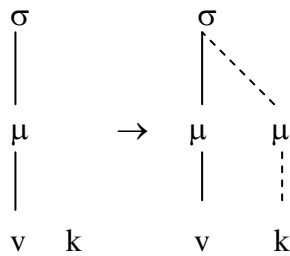
11. (i) Nucleus building rule - assign a mora to the syllable.



(ii) Onset building rule - assign a preceding consonant to the onset.

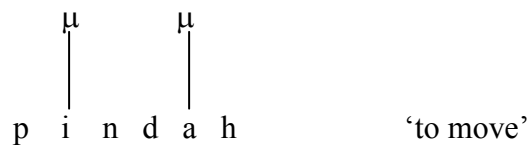


(iii) Coda building rule - assigns a single free consonant to the coda of the preceding syllable

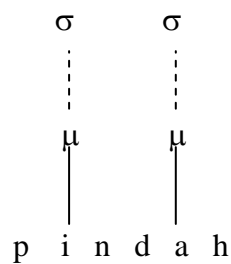


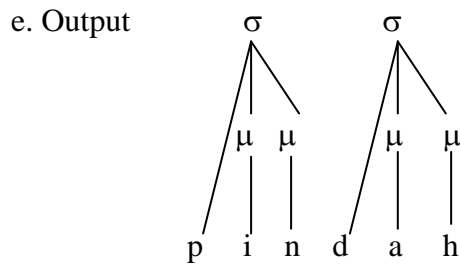
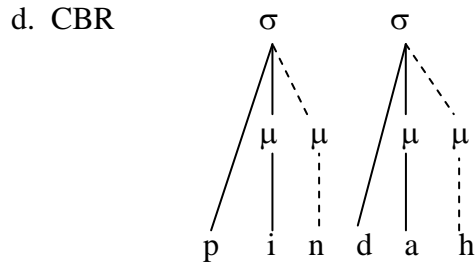
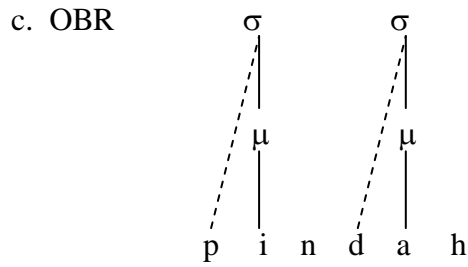
The coda in the third rule gets its mora by weight by position rule (Hayes 1989). How this set of rules operates is illustrated in the following derivation.

12. a. Input



b. NBR

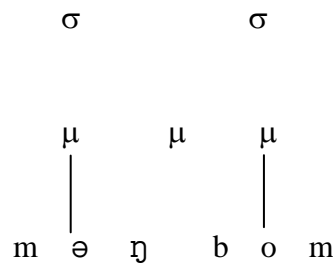




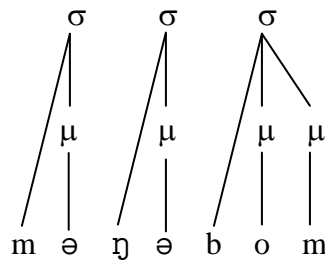
Although Malay syllables may have a single member coda, there is a restriction in the language which prohibits a small class of segments from occupying the coda position (Teoh 1994, Zaharani 2005). In the phonological analysis of syllable structures, the prohibition of some segments in the coda is governed by the Syllable Coda Condition. One of the syllable coda conditions in Malay is that the nasal consonants in the coda are always homorganic to the following obstruents.

Now let us observe how the syllable structure and the syllabification rules under the moraic model manage to account for the existence of two competitive variant derived from the so-called monosyllabic stems. First, we will display the derivation of the [məŋə] forms as illustrated in (13) below.

13. a. Underlying representation



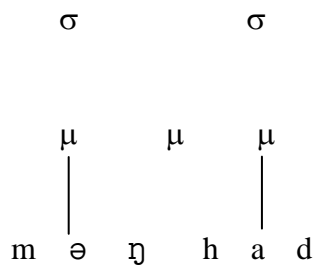
b Syllabification and schwa epenthesis



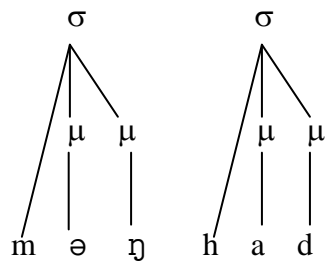
Parallel to the analysis of the CV model, the rules of nasal assimilation and nasal substitution cannot operate here because their structural descriptions are not fully met due to the presence of an empty mora. The velar nasal cannot be associated to the mora and syllabified as a coda of the first syllable because it will violate the syllable coda condition of the language which affirms that a nasal must be homorganic to the following obstruent. In this case the velar nasal is a stray segment and in order to be phonetically realized it has to be licenced to a syllable. The nasal is then resyllabified as an onset of the following syllable after the empty mora gets a vowel by the schwa epenthesis rule.

In the case where the rule of schwa epenthesis fails to apply, particularly in the context of prefixation with a dorsal initial consonant monosyllabic stem, the velar nasal is linked to the mora and syllabified as a coda of the first syllable. The following derivation illustrates the point we just made.

14. a. Underlying representation



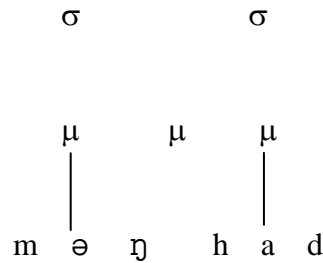
b. Syllabification



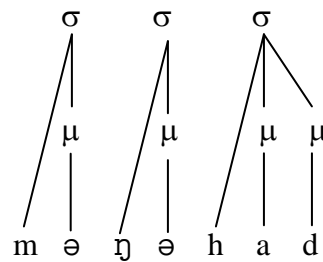
The representation in (14b) is in compliance with the basic syllable structure of the language, and therefore it is grammatical and acceptable. The acceptability is evident by the fact that the word is widely used by the speakers as attested in the DBP corpus. Bear in mind that there is also a case where the dorsal initial consonant monosyllabic stem takes the [məŋə] variant implying that the schwa epenthesis rule is in operation here. Under the present analysis, the [məŋə] variant can also be generated without violating the basic syllable structures of the language and the association principles.

Following the general rule of epenthesis in Malay, the empty mora is associated with an epenthetic schwa and the nasal segment is then resyllabified into the onset of the following syllable, motivated by the minimal onset satisfaction principle (Roca 1994). This straightforwardly explains the derivation of the [mɛŋɐ] variant as shown in (15). In the case of prefixation with the passive marker /di-/, the mora is associated with the preceding vowel to form a long vowel (16)

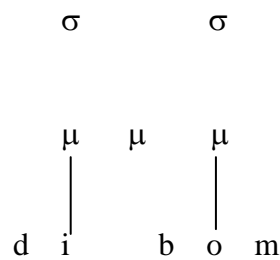
15. a. Underlying representation



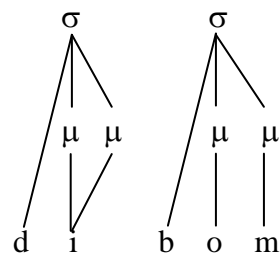
b. Syllabification and schwa epenthesis



16. a. Underlying representation



b. Syllabification and vowel lengthening



CONCLUSION

It is evident that so-called monosyllabic stems in Malay are lexically disyllabic with an empty segment at the skeletal tier. In Teoh (1994) and Zaharani (2000) analyses the empty segment is represented by a V-slot. This empty V-slot triggers the application of schwa epenthesis

rule, and at the same time prohibits the application of nasal assimilation, nasal substitution, nasal deletion rules. This representation however fails to account for the inapplicability of schwa epenthesis in the context of prefixation with a dorsal initial consonant monosyllabic stem.

In the present analysis, the empty segment is represented by a mora. The empty mora can be associated either with an epenthetic schwa or a consonant and also with final vowel of the prefix. Association with a consonant, particularly the nasal segment is governed by the syllable coda condition which states that the nasal consonants in the coda must always be homorganic to the following obstruents. Apparently, the association of mora with a vowel is more common than the consonant. This simply explains why the [məŋə] forms are more productive and widely used in the language. Indisputably, the [məŋ] form is also grammatical and acceptable because its formation is phonologically in compliance with the basic syllable structure of the language. In sum, the analysis of the moraic model is superior than the CV model in handling the phonology of /məŋ-/ and /di-/ prefixation with monosyllabic stems in Malay.

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