Malaysian English Monophthongs by Regional Malay Dialect Speakers: Convergence or Divergence?[1]

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Abstract
This study investigates the possible influence of Malay regional dialects on Malaysian English monophthongs. It compares the production of Malay and English monophthongs by male and female speakers of Standard Malay, Terengganu Malay and Kelantan Malay. Formant and Euclidean distance measurements show that although there are significant variations in Malay monophthong production, the speakers' English monophthongs tend to converge spectrally. Two second language phonology theories are used to explain the results.

Keywords
Malaysian English, monophthongs, Malay dialects, convergence, divergence, phonology

Introduction

The call for a greater integration between the fields of world Englishes and second language acquisition (Sridhar and Sridhar, 1987) entails, among other things, the application of the latter's theories in explaining variation phenomena in the former. Major second language phonology theories such as Perceptual Assimilation Model (PAM) (Best, 1995; Best and Tyler, 2007) and Speech Learning Model (SLM) (Flege, 1995, 2003) have variously highlighted the influential role of the first language (L1) on the production and perception of second language (L2) speech. These theories suggest that language learning abilities, unlike Critical Period Hypothesis's postulation (e.g. Richards and Schmidt, 2002) remain intact from childhood through to adulthood. Crucially, however, it is a speaker's accumulated experiences with his or her L1 that determine the outcomes of L2 speech production and perception.

In world Englishes, adopting such SLA phonological theories should lead researchers to confront at least two issues related to the L1: one, variation

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patterns that may or may not be traced down to their substrate sources and two, possible emergence of shared features by speakers who speak different L1's but continually interact with one another in English. The present study is concerned with both but it deals with them at a more delicate linguistic level. This is the dialectal level.

Hashim and Tan (2012) point out that research on Malaysian English (MalE) pronunciation norms is scarce, making it difficult to truly appreciate the unique speech features of MalE speakers. Gaudart notably argues that it is important to consider "the regional and ethnic phonological differences" when describing MalE (47). While the role of L1 dialects in L2 perception and production has been studied in other languages (e.g. Chladkova and Podlipsky, 2011 for Dutch; Gardner, 2010 and O'Brien and Smith, 2010 for German), little is known about how it affects English. The present study focuses on the vowels produced by three different groups of MalE speakers. Each group predominantly speaks a different (Malaysian) Malay dialect. We hope to complement the findings of previous studies in which speakers of the Malay ethnic origin were grouped as a single, dialectically undifferentiated entity. Existing descriptions of MalE usually depended on the speech samples produced by Standard Malay speakers of English or did not attempt to identify the Malay dialects of the speakers. This paper thus aims to find out the extent to which the English monophthongs produced by speakers of Malay regional dialects are different or similar to each other. In other words, do they converge or diverge?

Malay and its Regional Dialects

Malaysian Malays generally speak Malay as their first language. However, far from being homogenous, Karim, Onn, Musa and Abdul Hamid (1986) point out that there are more than ten regional dialects of Malay spoken in Malaysia. Some of these dialects are more closely related than others (Collins, 1989). The focus on Malay speakers of MalE is motivated by the size of this ethnic group in Malaysia's population makeup and the diversity of dialects that can be found within it. Three such dialects are investigated in this study: Standard Malay (StdM), Terengganu Malay (TrgM) and Kelantan Malay (KelM). The term "dialect" in this study is used to refer to a "regionally… distinctive variety of language, identified by a particular set of words and grammatical structure" (Crystal 142). A dialect is also "associated with a distinctive pronunciation or accent" (Crystal 142).[3]

[3] The relationship between "dialect" and "language" is, although obvious, notoriously complex (Crystal, 2008; Fromkin, Rodman and Hyams, 2010). While a language can be defined as a group of mutually intelligible dialects (Chambers and Trudgill, 1980), some dialects like Mandarin and Hokkien of the Chinese language, and conversely, some languages such as Swedish and Danish do not fulfil this criterion. The Malay dialects in this study, however, are spoken in the same country and are mutually intelligible.

StdM originates from a Malay dialect spoken in the southern state of Johor and the Indonesian province of Riau. It was adopted as the standard dialect (which also incorporated a written norm) after independence and propagated as the "standard" mostly through national broadcasting services. Many broadcasters in those early days originated from southern Peninsula Malaysia and subsequently used their pronunciation norms on radio and television (Omar, *The Linguistic Scenery in Malaysia* 171). The use of these norms spread and nowadays they are widely used in official functions, the media and by large numbers of speakers on the west coast of Peninsula Malaysia.[4]

TrgM is a dialect spoken mostly in the state of Terengganu on the east coast of the peninsula. Due to migration, some speakers are also found near the border of the neighbouring state of Pahang, as well as further afield in Mersing in the state of Johor. KelM is a dialect spoken in the state of Kelantan, also on the east coast of the peninsula. It is also spoken in the districts of Besut and Setiu in Terengganu, both of which are close to the Kelantan-Terengganu border (see Collins, 1989 on state-dialect correspondences in Malaysia and the need to update the Malay dialect map). Terengganu and Kelantan Malay are sometimes claimed to derive from an older proto-dialect called Patani-Kelantan-Terengganu Malay (e.g. Che Kob, 2007; Hussein, 1973; Omar, 1976). However, the evidence that has been advanced for the claim mostly involves corresponding consonantal innovations in the two dialects (see Che Kob, 2007). Their vowel systems, as will be shown below, do display some distinctive features.

Although each of the three dialects can be characterised by distinct phonetic and phonological features, all speakers share a common Malay heritage with no major cultural variation among them. Importantly, many TrgM and KelM speakers may use StdM in more formal situations especially when their interlocutors also use the latter dialect, possibly as an effort to "accommodate" (see Giles and Coupland, 1991). Task and register are also influential in determining the dialect features that are used by TrgM and KelM speakers.

Malay Monophthongs and Dialectal Variation

It is claimed in a number of studies that StdM has a rather small vowel inventory; it has six monophthongs and three diphthongs (Maris, 1980; Teoh, 1988, 1994). (The diphthongs are not discussed here.) These studies also highlight that vowel length is not phonemic in StdM. The monophthongs are shown in Table 1.

[4] There is another, albeit lesser-used, standard Malay dialect which can be found in northern Peninsula Malaysia and East Malaysia (Omar, 1992). However, attempts to promote its use nationwide in the 1990s, especially by a private television station, were not successful. The dialect was claimed to have more sound-spelling regularities than its Johor-Riau counterpart, although this was later disputed (Omar, 1992). Its main difference from the latter is the pronunciation of word-final –a in Malay orthography; whereas the northern dialect realises it as a lower back /ɑ/, its pronunciation in the Johor-Riau dialect is a schwa.

Table 1: Monophthongs in Standard Malay

	Front	Central	Back
close	[i]		[u]
mid	[e]	[ə]	[o]
open		[a]	

In the interest of space, the phonology of StdM vowels and their variations in TrgM and KelM are summarised in Table 2. For a fuller description, see Sulong (2013). The summary below is based on Ahmad (2006), Che Kob (1985), Karim (1965), Omar (1977), Onn (1980) and Teoh (1988, 1994).

Malaysian English Monophthongs

According to Mohd Don's impressionistic study (1997), speakers of MalE do not make a distinction between short and long vowels. For instance, /iː/ and /ɪ/ are pronounced as [i] in MalE which is close to Received Pronunciation (RP) /iː/. Words such as *seat* and *sit* become homophones in MalE due to the lack of durational distinction between these two vowels. Another long/short vowel pair is /uː/ and /ʊ/ which are pronounced as [u]. In MalE, these two vowels are pronounced almost identically so that words like *Luke* and *look* are homophones. The vowels /ɛ/ and /æ/ are pronounced as [e], making words like *pen* and *pan* homophones (Mohd Don, 1997). The vowels /ʌ/ and /ɑː/ are pronounced as [a], while /ə/ and /ɜː/ are pronounced as [ə]. In another impressionistic study, Baskaran reports that long MalE vowels in medial position tend to be shortened and, especially among basilectal speakers, short vowels in medial position tend to be lengthened (*A Malaysian English Primer* 29). Due to space constraints, however, results on vowel duration are not discussed in this paper.

In terms of vowel quality, Mohd Don (1997) points out that MalE /e/ has a more open realisation than RP /e/. Another characteristic of MalE vowels is that /ɒ/ and /ɔː/ are pronounced as [o] which is slightly higher or closer than Received Pronunciation (RP) and /ɒ/ with stronger lip rounding (Mohd Don, 1997). Baskaran claims that MalE back vowels like /ɔ/ and /ɑ/ tend to be higher than those of RP (*A Malaysian English Primer* 28). Mohd Don also claims that speakers' pronunciation in a number of cases is influenced by spelling (40). Speakers tend to replace the reduced vowel /ə/ with [a] such as in *particular, drama*, with [o] such as in *oblige, polite* and with [i] such as in *terrible*, *horrible*.

Table 2: Summary of vowel pronunciation in Standard Malay (StdM) and variations in Terengganu (TrgM) and Kelantan (KelM) Malay

StdM	TrgM	KelM
1. Final vowel /a/ reduction:	**1. Final vowel /a/ reduction:**	**1. Final vowel /a/ ▶ /ɔ/:**
e.g. /saja/ ▶ [sajə] (I)	e.g. /saja/ ▶ [sajə]	e.g. /saja/ ▶ [sajɔ]
2. Final r-drop(optional)	**2. Final r-drop**	**2. Final r-drop**
− preceding vowels lengthened	− preceding vowels lengthened, and /a/ becomes [ɔ]	− preceding vowels lengthened
e.g. /pasar/ ▶ [pasa:] (market)	e.g. /pasar/ ▶ [pasɔ:]	e.g. /pasar/ ▶ [pasa:]
− / i,u/ preceding /r/ lowered:	−/ i,u/ preceding /r/ lowered:	−/ i,u/ preceding /r/ lowered:
e.g. /hadir/ ▶ [hade:] (to attend)	e.g. /hadir/ ▶ [hade:]	e.g. /hadir/ ▶ [hade:]
e.g. /təlur/ ▶ [təlo:] (egg)	e.g. /təlur/ ▶ [təlɔ:]	e.g. /təlur/ ▶ [təlɔ:]
3. Final /l/ not dropped −preceding /a/ remains [a] e.g. /batal/ ▶ [batal] (to cancel) −preceding /i,u/ lowered to [e] and [o] respectively e.g. /katil/ ▶ [katel] (bed) e.g. /bətul/ ▶ [bətol] (correct)	**3. Final /l/- drop** −preceding /a/ lengthened to [a:] e.g. /batal/ ▶ [bata:] −preceding /i,u/ lowered and lengthened to [e:] and [o:] respectively e.g. /katil/ ▶ [kate:] e.g. /bətul/ ▶ [bəto:]	**3. Final /l/-drop** − preceding /a/ lengthened to [a:] e.g. /batal/ ▶ [bata:] −preceding /i,u/ lowered and lengthened to [e:] and [o:] respectively e.g. /katil/ ▶ [kate:] e.g. /bətul/ ▶ [bəto:]
4. Final k- glottalised	**4. Final k- glottalised**	**4. Final k- glottalised**
−preceding /a/-no changes e.g. /botak/ ▶ [botaʔ] (bald)	− preceding /a/ ▶ [ɔ] e.g. /botak/ ▶ [bɔtɔʔ]	− preceding /a/ ▶ [ɔ] e.g. /botak/ ▶ [bɔtɔʔ]
−preceding /i,u/ lowered. e.g. /pəkik/ ▶ [pəkeʔ] (to yell) e.g. /ləkuk/ ▶ [ləkoʔ] (dent)	−preceding /i,u/ lowered e.g. /pəkik/ ▶ [pəkeʔ] e.g. /ləkuk/ ▶ [ləkɔʔ]	−preceding /i,u/ lowered. e.g. /pəkik/ ▶ [pəkeʔ] e.g. /ləkuk/ ▶ [ləkɔʔ]
5.Final /p,t/ not glottalised	**5.Final /p,t/ glottalised**	**5.Final /p,t/ glottalised**
−preceding /a/-no changes e.g. /silap/ ▶ [silap] (wrong) e.g. /alat/ ▶ [alat] (tool)	−preceding /a/-no changes e.g. /silap/ ▶ [silaʔ] e.g. /alat/ ▶ [alaʔ]	−preceding /a/-no changes e.g. /silap/ ▶ [silaʔ] e.g. /alat/ ▶ [alaʔ]
−preceding /i,u/ lowered e.g. /kutip/ ▶ [kutep] (to pick up) e.g. /tutup/ ▶ [tutop] (to close) e.g. /sulit/ ▶ [sulet] (private) e.g. /patut/ ▶ [patot] (should)	−preceding /i,u/ lowered e.g. /kutip/ ▶ [kuteʔ] e.g. /tutup/ ▶ [tutoʔ] e.g. /sulit/ ▶ [suleʔ] e.g. /patut/ ▶ [patoʔ]	−preceding /i,u/ lowered e.g. /kutip/ ▶ [kuteʔ] e.g. /tutup/ ▶ [tutoʔ] e.g. /sulit/ ▶ [suleʔ] e.g. /patut/ ▶ [patoʔ]
6. Final /s/ ▶ /s/	**6. Final /s/ ▶ [h]**	**6. Final /s/ ▶ [h]**
−/a/ preceding [s] – no changes. e.g. /panas/ ▶ [panas] (hot)	−/a/ preceding [h] – no changes e.g. /panas/ ▶ [panah]	− /a/ preceding [h] – no change e.g. /panas/ ▶ [panah]
−/i,u/ preceding [s] lowered. e.g. /tulis/ ▶ [tules] (to write) e.g. /putus/ ▶ [putos] (disconnected)	−/i,u/ preceding [s] lowered (only slightly) e.g. /tulis/ ▶ [tuleh] e.g. /putus/ ▶ [putʊh]	−/i,u/ preceding [s] lowered (only slightly) e.g. /tulis/ ▶ [tuleh] e.g. /putus/ ▶ [putʊh]
7. Final /h/ remains /h/	**7. Final /h/ remains /h/**	**7. Final /h/ remains /h/**
−/a/ preceding [h]- no changes e.g. /salah/ ▶ [salah] (wrong)	−/a/ preceding /h/ ▶ [ɔ] e.g. /salah/ ▶ [salɔh]	−/a/ preceding /h/ ▶ [ɔ] e.g. /salah/ ▶ [salɔh]
−/i,u/ preceding /h/ lowered e.g. /pədih/ ▶ [pədeh] (smarting) e.g. /buluh/ ▶ [buloh] (bamboo)	−/i,u/ preceding /h/ lowered e.g. /pədih/ ▶ [pədeh] e.g. /buluh/ ▶ [buloh]	−/i,u/ preceding /h/ lowered e.g. /pədih/ ▶ [pədeh] e.g. /buluh/ ▶ [buloh]
8. All final nasal consonants remain the same (no changes)	**8. All final nasal consonants realised as [ŋ]**	**8. All final nasal consonants after /a/ dropped**
− preceding /a/ remains [a] e.g. /makan/ ▶ [makan] (to eat)	− preceding /a/ remains [a] e.g. /makan/ ▶ [makaŋ]	−/a/ becomes [ɛ̃] e.g. /makan/ ▶ [makɛ̃]
− preceding /i, u/ lowered	**8b. All final consonants following /i,u/ become [ŋ]** − preceding /i, u/ lowered	**8b. All final consonants following /i,u/ become [ŋ]** - preceding /i, u/ lowered
e.g. /makin/ ▶ [maken] (increasingly) e.g. /kuntum] ▶ [kuntom] (flower bud)	e.g. /makin/ ▶ [makeŋ] e.g. /kuntum/ ▶ [kutoŋ]	e.g. /makin/ ▶ [makeŋ] e.g. /kuntum/ ▶ [kutoŋ]

It is interesting to note that the few existing instrumental studies (Pillai, 2014; Pillai et al., 2010; Tan and Low, 2010) of MalE also showed that, even though their participants tended to conflate the long and short vowels spectrally, some length distinctions were made between the two vowels in each vowel pair. However, the data in these instrumental studies were obtained using words in a citation form. This may have caused the participants to be more cautious in their pronunciation. Not only that, the participants chosen were mostly highly proficient speakers of English. Therefore, they were capable of monitoring their pronunciation more closely in careful pronunciation.[5]

Speech Learning Model (SLM) and Perceptual Assimilation Model (PAM)

SLM predicts that the ability to acquire an L2 sound depends on the way the L2 learner perceives the L2 sound in relation to his/her L1 sounds (Flege, 1987; Flege, 2003; Frieda and Nozawa, 2007). In order to produce a phoneme in L2, an L2 learner should be able to perceive the criteria that distinguish the phoneme from other L2 phonemes as well as other L1 phonemes. However, due to the interaction between sounds in L1 and L2, L1 phonology may filter out some important acoustic properties of the L2 phoneme.

When a new sound in L2 is perceived as close to an L1 sound, L2 learners will normally assimilate the sound to the latter, an existing category. This is termed as "equivalence classification" (Flege, "The Production of 'New' and 'Similar' Phones" 49). This perceived similarity may be the result of some shared acoustic properties between L1 and L2 sounds making it hard for L2 learners to establish a new phonetic category. They often miss the minimal features that distinguish an L1 sound from a comparable L2 sound. However, when a new L2 sound is perceived as distant from any sound in L1, L2 learners may find it easier to perceptually differentiate it from the L1 counterpart and are more successful in creating the required new phonetic category. There is a continuum between "identical" and "new" in the interaction between L1 and L2 sounds.

Unlike SLM which is based on the psychoacoustic approach through which it studies acoustic cues for speech perception, PAM is based on Gibson's (1991) Direct Realist Theory which posits that a listener can decode a speech signal without having to cognitively process the information first. The information from the speech signal can be directly detected using integrated perceptual systems.

According to PAM, a listener may perceive a sound as a good or poor exemplar of a native phoneme (categorised), or it may be perceived as unlike any of the native phonemes. Less commonly, it may also be perceived as a non-linguistic non-speech sound (non-assimilated). There are six ways in which each phone in a contrasting non-native pair may be discriminated and categorised:

[5] While some authors choose to focus on acrolectal speakers due to the "stability" in their speech, we elect to study mesolectal speakers because (1) the majority of MalE speakers are bilinguals who are rarely equally competent in the languages they know (e.g. Ng and Wigglesworth, 2007), and (2) an entity such as a speech community that uses and simultaneously influences its variety of English must include all its members regardless of their proficiency levels (Nair-Venugopal, 2000).

1. Two category (TC) assimilation. Two contrasting non-native phones perceived as acceptable exemplars of two different native phonemes, i.e. one is assimilated to one native phoneme and the other one is assimilated to a different native phoneme. Discrimination is expected to be very good.
2. Single Category (SC) assimilation. Two contrasting non-native phones assimilated either poorly or well to one native phoneme. The two phones are poorly discriminated.
3. Category Goodness (CG). Two contrasting non-native phones are perceived as tokens of a single native phoneme, but one of them is more fitting to the native sound than the other. Discrimination is moderate to very good.
4. Uncategorised. Both of the contrasting non-native phones fail to be matched to any existing L1 phonetic category. Discrimination is poor to moderate depending on how close they are to the native phonemes.
5. Uncategorised-categorised assimilation. This happens when one non-native phone assimilates to one L1 phonetic category but the other L2 phone does not assimilate to any of the native phonemes.
6. Non-assimilable. These phones are not perceived as speech sound. Discrimination is moderate to good.

Methodology

The participants chosen for this study were 120 L1 Malay speakers aged between 18 to 25 years old. At the time of data collection, they were students of a Malaysian public university. Their proficiency had been identified by their English as a Second Language (ESL) instructors as lower-intermediate to intermediate.

The participants were from three different dialect groups which are StdM, TrgM and KelM speakers. Each dialect group consisted of 40 speakers, with 20 males and 20 females. The StdM speakers used Standard Malay in their daily conversations with friends and family. Though they might have lay knowledge of TrgM and KelM, they were unable to converse comfortably in either of these dialects. The TrgM and KelM participants used their respective dialects in daily interactions with family and friends and reported to do so frequently. However, they had been exposed to StdM since kindergarten and they were able to use this dialect, to various degrees of success, when they chose or were required to do so. TrgM and KelM speakers may use StdM when interacting with others who did not speak their dialects. They were also usually required to use StdM in formal situations.[6]

[6] Although they were not instructed to do so, TrgM and KelM speakers in this study variably adopted StdM in pronouncing the Malay words in Table 3. This was likely due to the perceived formality of

All participants had started learning English since kindergarten or six years old. At the university, the medium of instruction for most of the offered courses was English. The participants were required to use English for their oral presentations and expected to use at least a limited degree of English in dealing with academic matters with most of their instructors. English can therefore be considered their second language.

Two wordlists were used in this study. The first wordlist consisted of six Malay vowels while the second one comprised eleven English vowels. Each word on the list did not come in a carrier sentence.

The participants were asked to read aloud the wordlists. The words chosen for Malay were two-syllable words. One-syllable words are rarely found in Malay. Those that do occur are either loan words or variants of two-syllable words (Teoh, *The Sound System* 14). The set of six Malay vowels (see Table 3) are in a "/bV/+second syllable."

Table 3: Target words and corresponding phonetic symbols in Malay for monophthongs

	Word	Meaning	Phonetic symbol
Monophthong	b**a**sit [b**a**sit]	*a Malay male name*	a
	b**e**san [b**e**san]	*parents who are related by the marriage of their children*	e
	b**o**san [b**o**san]	*bored*	o
	b**i**sa [b**i**sə]	*venom*	i
	b**e**sar [b**ə**sa]	*big*	ə
	b**u**suk [b**u**suʔ]	*stinky*	u

For English, a set of 11 English vowels in a /hVd/ context (see Table 4) was used. The use of /hVd/ words was to ensure that the phonological contexts of the vowels were kept identical in order to control for coarticulatory effects (Cox, 2006; Maxwell and Fletcher, 2009).

Table 4: Target words and corresponding phonetic symbols in English for monophthongs

	Word	Phonetic symbol
Monophthong	h**ee**d	iː
	h**i**d	ɪ
	h**ea**d	e

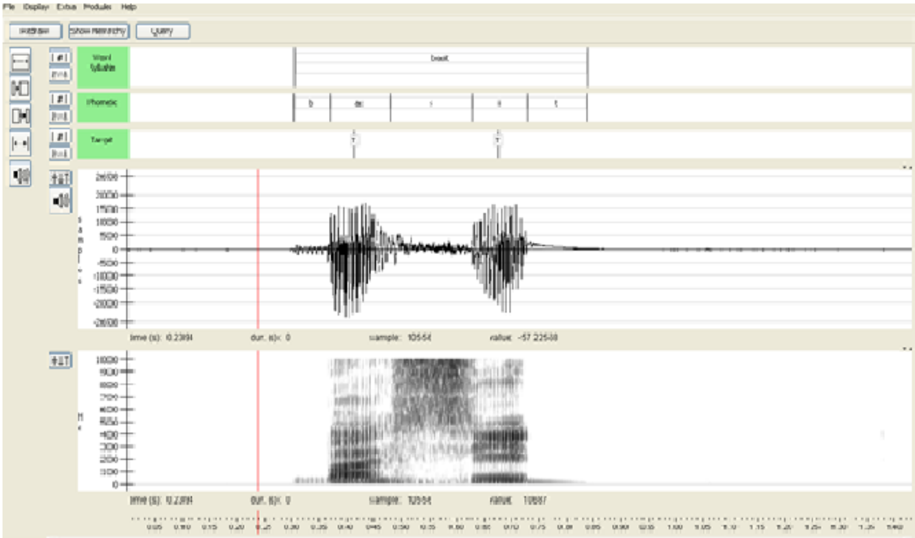
the task (see Giles and Coupland, 1991). The comparison with their English vowels was made with this awareness.

h**a**d	æ
h**u**d	ʌ
h**e**rd	ɜː
h**a**rd	ɑː
h**o**d	ɒ
h**o**rde	ɔː
h**oo**d	ʊ
wh**o**'d	uː

The participants were first briefed on the recording procedures. They then read out the randomly presented words one by one. Each word was repeated three times randomly dispersed throughout the recording to avoid order effects. The recordings were conducted in a quiet room using a 58 Shure microphone. The recordings were saved directly onto a computer in the *.wav* format.

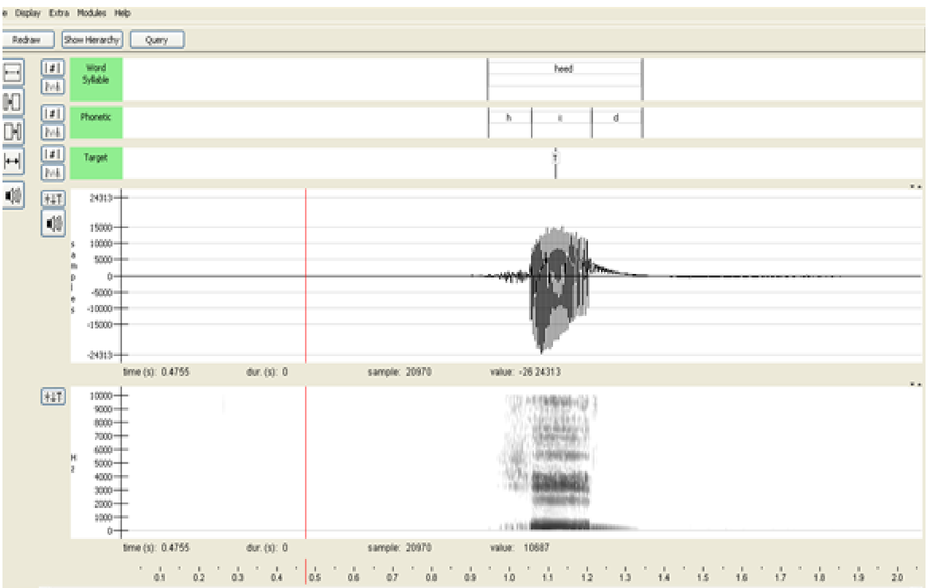
The study made use of formant measurement and Euclidean Distance (ED). First, the target of each vowel was identified. For a monophthong, this is often at the middle of the vowel where there is normally a steady state in which the vowel is least influenced by the surrounding sounds (Clark et al., 2007; Cox, 2006; Harrington and Cassidy, 1999; Kent and Read, 1992). In the present study, a single target was identified at midpoint (50%) for each monophthong, at which its first formant (F1) and second formant (F2) values were extracted. The F1 is often associated with the height of the vowel. The higher the F1 value, the lower the vowel is. The F2 is often regarded as an indication of the frontness or backness of a vowel. The higher the F2 value, the more front the vowel is. The frequencies of the first two formants were automatically established using a 12th order Linear Predictive Coding (LPC) analysis with a 49 ms raised cosine window and a frame shift of 5 ms. The F1 and F2 values of the vowels were extracted using R (see http://cran.r-project.org/). Figures 1 and 2 display an example of the segmentation and labelling of the Malay and English monophthongs respectively.

Figure 1: Vowel segmentation of Malay monophthongs



Malay [a] in "basit" is in the second segment

Figure 2: Vowel segmentation of English monophthongs



English [i:] in "heed" is in the second segment

The ED between the pairs [iː] and [ɪ], [uː] and [ʊ], [ɔː] and [ɒ], [ɑː] and [ʌ], [æ] and [ɛ] were measured for English. These vowel pairs were selected due to the closeness of their mean positions to one another in the vowel plot and the overlapping of their tokens in the scatter plots (not reproduced here). The ED values indicate the distinctness of one vowel from the other in each pair and thus may suggest the degree of merger between the two. The ED value between each vowel in a vowel pair was calculated by the square root of the sum of squares of the difference between the first two vowel formant frequencies of the vowels analysed. For example, to measure the distance between English [iː] and [i], the following equation, which is the transformed Pythagorean Theorem, was employed:

$$d = \sqrt{a^2 + b^2} = \sqrt{(F1_{i:} - F1_{i})^2 + (F2_{i:} - F2_{i})^2}$$

d represents ED. $F1_{i:} - F1_{i}$ indicates the difference between the F1 value of [iː] and that of [i]. Meanwhile, $F2_{i:} - F2_{i}$ corresponds to the difference between the F2 value of [iː] and that of [i].

When the value of *d* is small, it signifies a small ED which suggests that the English vowel [iː] is close to the English vowel [i] in the F1 against F2 vowel plot in our example above. For the statistical analysis, F1 and F2 values of the three repetitions for each vowel token were averaged, thus each vowel pair had only one averaged ED value.

3. Findings

This section begins with the presentation of the analysis of Malay monophthongs produced by both male and female groups. Table 5 displays the mean values of the F1 and F2 of the Malay monophthongs produced by the three male groups, Terengganu Males (TM), Kelantan Males (KM) and Standard Malay Males (SM).

Table 5: Mean values of the F1 and F2 of the Malay monophthongs: TM, KM and SM

		Mean F1	SD	Mean F2	SD
TM	**[a]**	643.91	65.41	1482.69	86.98
	[e]	445.76	54.52	1921.66	104.99
	[ə]	419.10	49.96	1470.83	101.38
	[i]	268.76	21.71	2127.77	103.74
	[o]	456.28	54.55	1027.73	95.60
	[u]	324.48	38.25	1008.37	120.97
KM	**[a]**	708.96	69.63	1470.02	112.39
	[e]	470.80	55.87	1949.37	130.37

	[ə]	418.81	58.98	1517.90	90.63
	[i]	275.12	28.81	2163.15	137.69
	[o]	486.16	61.35	1049.74	83.09
	[u]	310.85	40.19	1001.07	107.31
SM	**[a]**	641.37	75.78	1476.50	95.99
	[e]	385.13	53.46	2039.31	138.29
	[ə]	392.45	51.42	1491.74	108.37
	[i]	257.07	31.75	2134.90	139.20
	[o]	388.81	50.87	983.76	92.33
	[u]	291.24	33.53	1006.44	111.49

The mean values of the F1 and F2 of the Malay monophthongs produced by the female groups, Terengganu Females (TF), Kelantan Females (KF) and Standard Malay Females (SF) are presented in Table 6.

Table 6: Mean values of the F1 and F2 of the Malay monophthongs: TF, KF and SF

		Mean F1	**SD**	**Mean F2**	**SD**
TF	**[a]**	904.34	69.37	1782.78	111.70
	[e]	421.93	87.82	2503.02	215.12
	[ə]	417.09	78.00	1754.23	151.89
	[i]	252.84	31.28	2720.40	183.19
	[o]	430.66	87.43	1043.09	137.29
	[u]	311.16	39.09	1022.75	179.68
KF	**[a]**	889.83	76.23	1751.57	127.47
	[e]	462.04	80.50	2438.48	190.70
	[ə]	448.83	59.16	1770.88	142.51
	[i]	262.44	28.85	2685.33	180.86
	[o]	452.52	78.41	1054.36	147.75
	[u]	313.90	43.64	934.13	142.35
SF	**[a]**	903.74	112.52	1863.43	139.92
	[e]	407.08	86.47	2548.43	233.89
	[ə]	408.91	78.05	1825.08	174.92
	[i]	269.37	51.06	2767.54	233.54
	[o]	406.10	88.19	1114.91	261.96
	[u]	327.56	78.72	1073.07	223.24

Linear mixed models were separately conducted on the F1 and F2 values in Hertz of the monophthongs produced by both gender groups. In these analyses, "dialect" was the main effect and "speaker" was the random factor. For each monophthong, there were 180 (60 speakers x 3 repetitions) tokens analysed. For all six vowels, 1080 tokens of each formant were analysed for each gender.

The analyses revealed a significant effect of "dialect" for:

Male Groups
[a] F1 (F=17.73, p=0.000),
[e] F1 (F=37.87, p=0.000) F2 (F=14.05, p=0.000),
[ə] F1 (F= 4.75, p=0.010) F2 (F=3.208, p= 0.043),
[i] F2 (F=6.45, p=0.002),
[o] F1 (F=47.17, p=0.000) F2(F=8.34, p=0.000),
[u] F1 (F=12.00, p= 0.000).

Female Groups
[a] F1 (F=12.05, p=0.000),
[e] F1 (F=6.58, p=0.002) F2 (F=3.88, p=0.022)
[ə] F1 (F= 4.958, p=0.008) F2 (F=3.318, p=0.039)
[o] F1 (F=4.40, p=0.014),
[u] F2 (F=8.56, p=0.000),

Next, we present the results of pairwise comparisons which were carried out on each monophthong that returned a significant effect to determine between-dialect differences in the F1 and F2 values

For the male groups, TM's and KM's realisations of [o] are more open and front than that of SM. The mean positions of Malay [u] and [o] for SM are found to be the closest. Unlike those of TM and KM, the Malay monophthong [o] of SM is more retracted. SM Malay [i] and [e] are closer to each other compared to those of TM and KM. The position of [i] does not seem to differ substantially for the three male groups. SM [e] is phonetically the most close and most front of the three dialects. As for [a], KM is found to display the most open realisation of this monophthong among the three groups.

For the three female groups, the results reveal that KF Malay [u] is significantly more retracted than that of SF. We also find that SF [a] is significantly more front than others. It is apparent that KF [e] and [o] are significantly lower than those of SF. The results also reveal that SF Malay [i] and [e] are slightly closer to each other compared to those of TF and KF. For [i], TF, KF and SF do not seem to differ greatly. SF [e] is the most close and front.

The results show that among male speakers, TM and KM tend to vary significantly from SM for most Malay monophthongs. Even though TM does exhibit a few significant variations from KM such as for the F1 of [a] and [e], most of them are only marginally significant. In contrast to the male groups, the results for the female groups indicate fewer significant variations among the groups. The variations are mainly between KF and SF speakers.

Having established the variations in their Malay monophthongs, we now consider the participants' English monophthongs. Later we will evaluate the correspondence between these two sets of vowels. The following section displays the results of the analyses for both male and female groups. Table 7 presents the mean values of the F1 and F2 of the English monophthongs produced by the three male groups, TM, KM and SM.

Table 7: Mean values of the F1 and F2 of the English monophthongs: TM, KM and SM

	Mean F1	SD	Mean F2	SD
TM[ɛ]	455.09	107.47	2043.55	184.62
[ɪ]	300.89	77.17	2102.71	427.32
[ɒ]	585.21	90.34	1084.53	116.32
[ʊ]	332.30	36.58	1032.44	145.53
[ʌ]	718.06	89.28	1468.51	134.85
[æ]	628.99	40.63	1859.49	105.92
[ɑː]	748.98	65.10	1357.52	133.59
[iː]	288.23	27.37	2230.08	141.32
[ɔː]	443.46	80.01	1093.89	185.95
[uː]	323.12	31.69	986.80	167.49
[ɜː]	471.57	43.10	1604.32	160.50
KM[ɛ]	429.14	78.61	2118.25	121.58
[ɪ]	298.05	41.59	2192.11	119.00
[ɒ]	560.61	131.45	1085.93	135.47
[ʊ]	315.52	38.06	993.00	119.58
[ʌ]	751.53	95.02	1451.22	135.35
[æ]	628.55	66.23	1906.48	133.47
[ɑː]	773.81	83.67	1340.36	107.00
[iː]	290.59	27.96	2215.36	92.91
[ɔː]	420.97	96.27	1033.22	120.51
[uː]	297.21	31.69	932.71	493.14
[ɜː]	500.00	59.87	1532.75	183.93
SM[ɛ]	462.35	118.67	2064.19	157.48
[ɪ]	306.86	42.62	2142.37	152.95
[ɒ]	586.37	126.65	1156.55	139.37
[ʊ]	350.67	95.01	1060.32	134.66
[ʌ]	700.35	87.96	1517.80	143.60
[æ]	642.78	81.54	1899.86	166.29
[ɑː]	761.69	69.82	1429.37	160.90
[iː]	292.85	34.44	2192.20	141.26
[ɔː]	433.09	92.61	1069.58	166.21
[uː]	320.98	50.18	973.75	131.10
[ɜː]	461.20	58.43	1521.30	121.58

The mean values of the F1 and F2 of the female groups' English monophthongs are presented in Table 8.

Table 8: Mean values of the F1 and F2 of the English monophthongs: TF, KF and SF

	Mean F1	SD	Mean F2	SD
TF [ɛ]	468.07	77.18	2644.25	255.67
[ɪ]	323.69	80.58	2780.00	195.27
[ɒ]	681.22	175.48	1246.75	149.95
[ʊ]	375.23	64.38	1057.45	130.66
[ʌ]	955.56	113.69	1727.68	149.26
[æ]	797.88	109.48	2289.33	169.85
[ɑː]	980.62	89.99	1574.23	153.47
[iː]	298.12	44.71	2797.11	156.39
[ɔː]	520.76	123.84	1152.25	132.71
[uː]	364.22	47.99	1049.76	145.41
[ɜː]	573.85	101.09	1832.20	149.87
KF [ɛ]	471.70	80.58	2611.85	199.08
[ɪ]	304.42	49.84	2763.05	154.40
[ɒ]	676.84	171.20	1238.46	148.94
[ʊ]	397.05	80.39	1086.78	206.83
[ʌ]	975.59	79.27	1752.04	156.13
[æ]	794.78	94.00	2267.79	164.62
[ɑː]	979.049	89.58	1633.82	150.73
[iː]	300.27	54.00	2735.76	190.08
[ɔː]	471.53	62.06	1170.08	137.25
[uː]	381.54	72.68	1024.42	191.20
[ɜː]	534.81	107.58	1832.89	139.64
SF [ɛ]	562.18	170.29	2564.06	248.38
[ɪ]	351.83	92.01	2823.11	218.85
[ɒ]	650.98	186.47	1265.08	159.59
[ʊ]	380.85	95.13	1003.26	208.03
[ʌ]	971.08	136.94	1807.78	180.42
[æ]	851.60	104.82	2297.09	184.81
[ɑː]	959.59	99.47	1674.73	168.22
[iː]	302.99	62.64	2858.47	208.60
[ɔː]	514.40	134.43	1200.51	173.28
[uː]	346.93	69.65	926.46	187.92
[ɜː]	588.73	109.43	1929.57	177.55

For each gender, linear mixed models with "F1 and F2 values in Hertz" as dependent variables, "speaker" as the random factor and "dialect" as the fixed factor were conducted. For each monophthong, there were 180 (60 speakers x 3 repetitions) tokens analysed. Two male speakers, however, had mispronounced the English monophthong [ɪ]. Thus, for [ɪ], only 174 tokens were analysed from the male groups (58 speakers x 3 repeats). As a result, a total of 1434 tokens of durational values of the monophthongs were analysed for the male groups.

For the female groups, 1971 tokens of English monophthongs produced were examined in total. This is due to the mispronunciation of [ʌ]. Only 174 tokens of [ʌ] were analysed as it had been mispronounced as [u] by two of the speakers (58 speakers x 3 repeats). In addition, one female speaker had also mispronounced [ɪ] resulting in only 177 tokens (59 speakers x 3 repeats) of the vowel being analysed.

The analyses revealed a significant effect of "dialect" for:

	Male Groups		Female Groups
[ɒ]	F2 (F=5.740, p=0.004),	[ɛ]	F1 (F=12.064, p=0.000),
[ʊ]	F1 (F=6.416, p=0.003),	[ɪ]	F1 (F=5.510, p=0.005),
[ʌ]	F1 (F= 4.804, p=0.009)	[uː]	F1 (F=4.292, p=0.015)
	F2(F=3.863, p= 0.23),		F2(F=8.149, p=0.000),
[ɑː]	F2 (F=6.918, p=0.003),	[æ]	F1 (F=5.611, p=0.004),
[uː]	F1 (F=7.368, p=0.001),	[ɑː]	F2 (F=6.039, p=0.003),
[ɜː]	F1 (F=8.082, p= 0.000)	[ɜː]	F1(F=4.056, p=0.019)
	F2(F=7.646, p=0.001).		F2(F=7.536, p=0.001),
		[ɔː]	F1 (F=3.372, p=0.037),
		[ʌ]	F2 (F= 3.701, p=0.027),
		[iː]	F2 (F=6.425, p=0.002).

The mixed model analyses of the F1 and F2 of the English monophthongs revealed that the female groups display slightly more significant "dialect" effects than their male counterparts in the F1 and F2 values of English monophthongs.

The English monophthongs which returned a significant effect in the mixed model analyses were further examined. Pairwise comparisons were carried out on the F1 and F2 values of these monophthongs in order to examine between-dialect differences.

For male speakers, SM [ɒ] is more front, while the group's [ʊ] is more open compared to those of TM and KM. SM also varies significantly from KM in the realisation of [ʌ] and [ɑː]. Its [ʌ] is higher than that of KM, while the group's [ɑː] is more front as compared to that of KM. For [uː] and [ɜː], KM tends to vary significantly from both TM and SM. It appears that KM [uː] is significantly higher than those of TM and SM, while its [ɜː] is lower than those of the other two groups. In addition, KM [ɜː] is also significantly less front compared to that of SM. The positions of these monophthongs as produced by the three male groups are depicted in Figure 3.

The data from the female groups were also submitted to pairwise comparisons. For [ɛ], [u:] and [ɜ:], Standard Malay females' (SF) tokens vary significantly from those of TF and KF. It reveals that SF [ɛ] is lower than those of TF and KF. This variation is probably due to aberration as a few of SF speakers produced it as low as their [æ], causing the mean F1 of SF [ɛ] to become higher than those of TF and KF. It is also observed that SF [ɜ:] is more front compared to those of TF and KF, while its [u:] is more back than those of TF and KF, as well as higher than that of KF. In addition, some significant variations are displayed between SF [ɪ], [æ] and [i:] and their KF counterparts. Both SF [ɪ] and [æ] are significantly lower than those of KF. There is a greater tendency for [ɪ] realised by SF speakers to overlap with [ɛ] instead of with [i:] which perhaps causes the mean value of the group's [ɪ] to become higher in F1. The results also demonstrate a more front SF [i:] compared to that of KF. As for [ɑ:], SF appears to be significantly more front than TF. Figure 4 displays the positions of these English monophthongs as realised by TF, KF and SF.

Figure 3: Plot of the first two formants (in Bark) for English monophthongs: TM, KM and SM

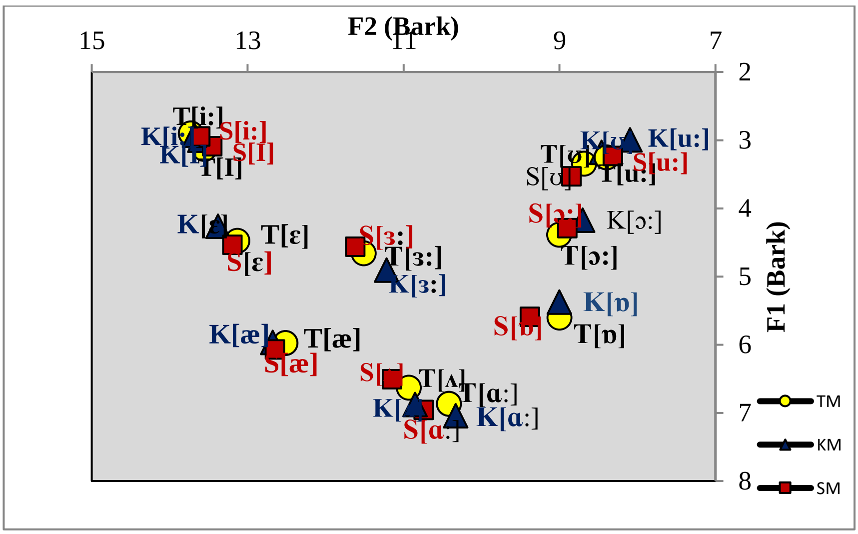
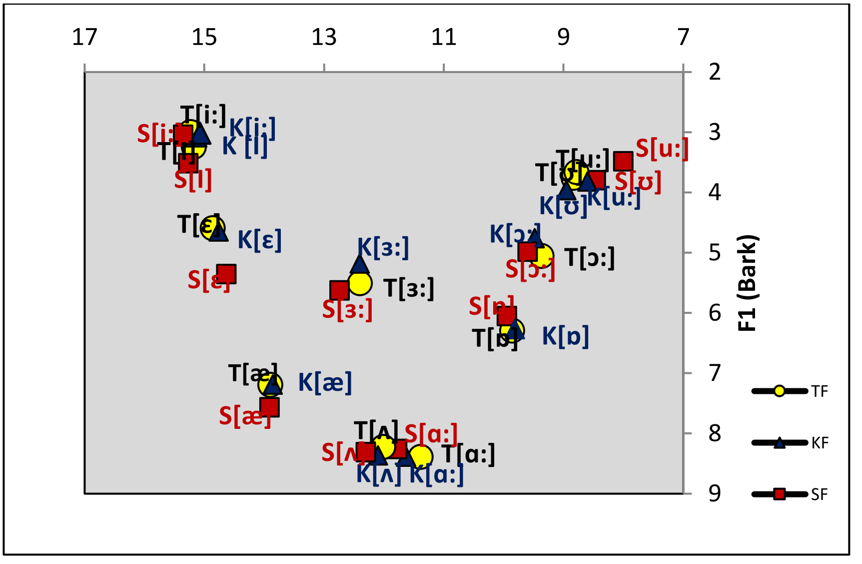


Figure 4: Plot of the first two formants (in Bark) for English monophthongs: TF, KF and SF



To examine their distinctness (or lack thereof), the ED values between the two vowels of five pairs of monophthongs, [iː] and [ɪ], [uː] and [ʊ], [ɔː] and [ɒ], [ɑː] and [ʌ], and [æ] and [ɛ] were computed. The mean ED values for all the five vowel pairs produced by the male groups, TM, KM and SM and female groups, TF, KF and SF are presented in Table 9 and Table 10 respectively. The results show that the ED values between the vowels in the pairs [iː] and [ɪ] and [uː] and [ʊ] are among the smallest and that between [æ] and [ɛ] is the largest.

Table 9: Mean and standard deviation (SD) of the Euclidean distance (Hz) between five English vowel pairs: TM, KM and SM

	Vowel Pair	Mean	SD
TM	**[iː] to [ɪ]**	73.597	76.732
	[uː] to [ʊ]	89.667	88.727
	[ɑː] to [ʌ]	129.233	68.970
	[ɔː] to [ɒ]	189.810	109.483
	[æ] to [ɛ]	265.210	148.975
KM	**[iː] to [ɪ]**	49.381	55.735
	[uː] to [ʊ]	92.354	70.158
	[ɑː] to [ʌ]	134.099	74.907
	[ɔː] to [ɒ]	176.489	101.129

	[æ] to [ɛ]	310.306	129.290
SM	**[iː] to [ɪ]**	61.144	38.574
	[uː] to [ʊ]	136.110	104.448
	[ɑː] to [ʌ]	154.475	124.788
	[ɔː] to [ɒ]	208.388	138.904
	[æ] to [ɛ]	278.700	177.161

Table 10: Mean and standard deviation (SD) of the Euclidean distance (Hz) between five English vowel pairs: TF, KF and SF

	Vowel Pair	**Mean**	**SD**
TF	**[iː] to [ɪ]**	90.900	74.466
	[uː] to [ʊ]	75.085	46.146
	[ɑː] to [ʌ]	189.050	139.288
	[ɔː] to [ɒ]	267.560	162.040
	[æ] to [ɛ]	497.848	161.217
KF	**[iː] to [ɪ]**	96.896	76.555
	[uː] to [ʊ]	132.817	95.490
	[ɑː] to [ʌ]	134.160	79.571
	[ɔː] to [ɒ]	250.439	159.471
	[æ] to [ɛ]	476.771	122.927
SF	**[iː] to [ɪ]**	135.405	83.005
	[uː] to [ʊ]	147.475	92.805
	[ɑː] to [ʌ]	216.835	101.756
	[ɔː] to [ɒ]	178.668	116.071
	[æ] to [ɛ]	411.041	203.945

The results were submitted to a mixed model analysis separately for each vowel pair to determine the significance of the three dialects' differences in the ED values. For each pair, there were 60 tokens analysed. For the male groups, the pair [iː] and [ɪ] had only 58 tokens (1 vowel pair x 58 speakers) as two of the speakers had mispronounced the vowels; all other pairs had 60 tokens (1 vowel pair x 60 speakers) each. Thus, for the five vowel pairs, 298 tokens were analysed. For the female groups, a total of 277 tokens were analysed. Only 59 and 58 tokens were examined for the pairs [iː] and [ɪ] as well as [ɑː] and [ʌ] respectively. In the analyses for each gender, "dialect" was the fixed factor while "speaker" was the random factor. Since none of the pairs yielded any significant result in the cross-dialect difference, pairwise comparisons were not carried out.

The results of the ED analyses exhibit the smallest ED value for the pair [iː] and [ɪ] for almost all the dialect groups, suggesting that the two vowels are the least distinct from one another. In contrast, all the groups display the largest ED value for the pair [æ] and [ɛ] indicating that the two vowels in the pair are the most different as compared to those of other pairs.

Discussion

We will discuss vowel production variation in English firstly by evaluating how much the three groups' monophthongs diverge from one another's. We will then consider the findings from SLM and PAM perspectives. Finally, we will compare our findings to those of other studies on MalE.

Overall, the English monophthongs of the three dialect groups do not show extensive spectral variation. This is in spite of the considerable variation that they demonstrate in their production of Malay vowels. The results indicate a slightly higher degree of spectral variation by female speakers.[7] Figures 3 and 4 above give a visual illustration of the limited extent of the divergences that can be observed in their monophthong production. We therefore suggest that L1 dialect may not be able to directly predict the spectral qualities of L2 English monophthongs.

Other than that, the results suggest that MalE speakers, regardless of their level of proficiency, do not differ greatly in their realisation of English monophthongs. This finding suggests some degree of MalE endonormativity. Our results for speakers with low-intermediate to intermediate levels of proficiency in English are largely consistent with the results of earlier studies which focused on high proficiency speakers. This will be elaborated below when we discuss the findings in relation to other MalE studies.

It has been established that L1 and L2 sounds are interrelated with one another. SLM and PAM predict that an L2 learner with a much simpler L1 sound system will have more difficulties to perceive and produce a more complex L2 sound system (see above). Considering Malay has only six vowels, the difficulties with which its speakers have in realising some of the English monophthongs is not surprising. In fact, the findings of this study confirm the predictions of SLM and PAM.

The results demonstrate a lack of spectral contrast by Malay speakers in realising the following vowel pairs in English: [ɪ] to [iː], [ʊ] to [uː] and [ʌ] to [ɑː]. The closeness between the two members in each of these pairs is demonstrated by the small ED values between them. Here, we use Hawkins and Midgley's

[7] It cannot be argued that such variations can be attributed to the difference in the level of proficiency of the female groups given that the different dialect groups for both male and female have approximately the same number of participants of lower-intermediate to intermediate proficiency levels.

(2005) RP data measurements obtained from "hVd" utterances produced by a group of five 20 to 25 year old males to put the differences in perspective.[8] Compared to the ED values derived from Hawkins and Midgley's (2005) formant measurements, it becomes apparent that in our study the ED values between the members of these pairs are much smaller. The ED values between the Malay male speakers' English [ɪ] and [iː] as well as those of their English [ʊ] and [uː] are around 100Hz, while it is 202Hz for the ED of RP [ɪ] to [iː] and 354Hz for the ED of RP [ʊ] to [uː]. The male participants' ED values of English [ʌ] to [ɑː] are also rather small at around 150Hz which is also lesser than that of the RP at 177Hz. It can be said that the speakers in this study tend to assimilate the L2 vowels of the pair into one single sound based on their L1 knowledge.

The study's results agree with SLM's prediction that these speakers do not form two distinct categories for the vowels due to the mechanism of equivalence classification which blocks the formation of a new category when the vowels in each pair are perceived as "similar" to a Malay phoneme. SLM explains that these speakers fail to discriminate and produce the associated non-native contrasts of each English pair due to a "similarity effect" (Flege, 1987, 1988, 1995). By comparing the results depicted in Tables 5, 6, 7 and 8 above, we can see that MalE speakers' English [ɪ] and [iː] are categorised to fit their Malay [i], English [ʊ] and [uː] to fit Malay [u] and English [ʌ] to [ɑː] to fit Malay [a]. These findings also support PAM's Single Category (SC) assimilation prediction which states that discriminations between two non-native phonemes are very poor when both of them are categorised to fit one native phoneme. This explains the lack of contrast between the vowels in these pairs. The Malay speakers in this study have assimilated both English [ɪ] and [iː] to their Malay [i], English [ʊ] and [uː] to Malay [u], and English [ʌ] and [ɑː] to Malay [a]. But in each case, the long vowel spectrally differs from the short vowel in their resemblance to the Malay counterpart only slightly, making discrimination problematic.

The study also highlights two vowel pairs whose members were moderately distinguished from each other, [ɔː] and [ɒ], and [æ] and [ɛ]. The results are consistent with PAM's category goodness (CG) assimilation as the English [ɛ] is assimilated to their Malay [e] whereas their English [æ] is not, resulting in some degree of discrimination of the two vowels. The same explanation can be used for [ɔː] and [ɒ] in which English [ɒ] is not as well assimilated to their Malay [o] as their English [ɔː]. In terms of SLM, we may explain these outcomes in relation to

[8] See measurements for RP in Hawkins and Midgley (2005) for comparison: heed [iː] F1 276Hz F2 2338Hz, hid [I] F1 393Hz F2 2174Hz, head [ɛ] F1 600Hz F2 1914Hz, had [æ] F1 917Hz F2 1473Hz, hod [ɒ] F1 484Hz F2 865Hz, hoard [ɔː] F1 392Hz F2 630Hz, hard [ɑː] F1 604Hz F2 1040Hz, hud [ʌ] F1 658Hz F2 1200Hz, who'd [uː] F1 289Hz F2 1616Hz, hood [ʊ] F1 413Hz F2 1285Hz.

the formation of "new categories" which contribute to the discrimination between each two vowels in the pairs. In this case, the relative distance of English [ɒ] and [æ] to the speakers' Malay [o] and [e] respectively has resulted in new categories being formed, although not as clearly as their native English exemplars. Based on Hawkins and Midgley's measurements, the ED for RP [ɛ] to [æ] is 543Hz. In contrast, the ED of the English [ɛ] to [æ] realised by Malay male speakers is much smaller, ranging from 300Hz (for TM and KM) to 310Hz (for SM). The ED value between RP [ɔː] and [ɒ] is 252Hz; however, the ED values of English [ɔː] to [ɒ] realised by the participants in this study are smaller i.e. around 200Hz.

Finally, the lack of spectral contrast between MalE vowel pairs [ɪ] and [iː], [ʌ] and [ɑː], and [ʊ] and [uː] in this study has been described earlier in the impressionistic studies by Baskaran (2004, 2005), Rajadurai (2006), Mohd Don (1997) and in previous acoustic studies on MalE vowels by Pillai et al. (2010) and Tan and Low (2010), as well as in a review of these by Hashim and Tan (2012). However, the findings of this study contradict some of the earlier studies (e.g. Mohd Don, 1997) in that our speakers did spectrally differentiate [æ] from [ɛ]. This result concurs with that of Tan and Low (2010) in which they report that their participants differentiated [æ] from [ɛ] in a citation task but not in extended reading. Since the data in the present study were also obtained from citation, these consistent findings are not surprising.

The results of the present study also indicate that some MalE speakers do differentiate the vowel pair [ɔː] and [ɒ] based on a statistical difference between the average positions of the two vowels. However, it remains to be seen if this distinction can be maintained in a more conversational task.

Conclusion

To conclude, the English monophthongs of the three Malay dialect groups – StdM, TrgM and KelM – do demonstrate a number of variations although these are not extensive. Variations for male and female groups pattern differently and L1 dialect does not appear to directly influence the observed patterns. The highest degree of variation can be found in the comparison between the spectral qualities of KelM and StdM.

The patterns of variation shared by the three groups are consistent with many of those documented in previous studies on MalE. The convergence displayed by them is also similar to that shown in Pillai et al.'s (2010) study involving speakers of MalE from different ethnic groups. These monophthongs can thus be regarded as reliable markers of MalE pronunciation. It would be interesting to investigate if the same level of fidelity can be found in the case of diphthongs. Comparison should also be made with other varieties in the region to evaluate specific SLA effects. Other than that, future research should obtain data through more conversational tasks and ascertain if the same converging patterns exist among these speakers.

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