CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter discusses on the background of the study and brief description of Kedah Malay. The objectives, research questions and limitations of the study are also discussed in the same chapter.

1.2 A brief background of the Malay Language

The Malay language has a long history and is spoken by many speakers as it has been lingua franca for the speakers in Malaysia, southern Philippines, Indonesia, Singapore as well as Brunei (Asmah, 1982). There are linguistic, extra linguistic and sociolinguistic factors that enabled Malay to become the lingua franca of this region. One of it was due to its simplicity in terms of phonological system (Asmah, 1982). For instance, the vowels in Malay are primary cardinals with the exception for few Malay varieties, such as Kelantan Malay, and the consonants are easier to articulate for non-native speakers "compared to the Javanese *heavy* ones" (Asmah, 1982, 4). In addition, the grammatical system of the Malay language also helps to speed up the process of acquiring the language as there are no categories for case, tense, number and gender unlike other languages (Asmah, 1982). Therefore, it is not surprising that the Malay language spread rapidly in this region and become a lingua-franca "as early as the seventh century AD" (Asmah, 1982, 2). This took place when foreign travellers visited the Malay peninsula recorded that the common language used for communication during that time was Malay language. In Malaysia particularly, the spread of the Malay language emerged after gaining independence from Great Britain. The same goes to Indonesia (Asmah, 1982). Upon independence, the use of the language in official functions, educational institutions and government administration increased.

In her extensive work on the Malay language in Malaysia, Asmah Haji Omar (1982) discussed the notion of local differences in Malay. These differences are in terms of the lexical items as well as the phonological features. In Malaysia, there are two main divisions of the Malays, separated geographically, namely the Sabah-Sarawak chain and the peninsular chain (Asmah, 1982). In discussing the Malays in the peninsular, researchers have attempted to categorise them based on political units, placing them in three distinct groups such as The East Coast Malay, The Northern Malay and The Southern Malay. Asmah (1982), on the other hand, divided Malays into four main groups that consisted of the north-western group that includes Kedah, Perlis and Penang, the north-eastern group that comprises Kelantan Malay, the eastern group with Terengganu Malay, and the southern group made up of Johor, Melaka, Pahang, Selangor and Perak.

1.3 Kedah Malay

Kedah Malay falls in the same group of Perlis and Penang Malay. The reason behind this is due to the phonological system of Kedah Malay that is closely affiliated with that of Penang Malay. In addition, the historical backgrounds of the two states have also provided confirmation on the similarities between the two varieties.

Historically, Kedah Malay was influenced by other nearby Malay dialects namely Perlis Malay and Perak Malay due to the political affairs and geographical condition of the states concerned (Asmah, 2008). The influence of Perlis Malay was due to the separation of the state by the Siamese reign. However, it had little impact on the language used by the citizens as the divided states used to be one state before; this denoted that the settlers employed the same Malay. On the other hand, the influence of Kedah Malay on north Perak was associated with the geographical situation of the state where people could travel at ease as there were no thick forests or mountains to hinder

them from travelling and communicating with each other from the different areas (Asmah, 2008). Kedah Malay also spreads to other parts of Perak to Kuala Kangsar and due to this Asmah (1982) concludes that the Malay spoken in Kedah, Perak and Penang were one single Malay language based on the phonetic characteristics available in each one (Asmah, 1982). Historical evidence suggests that the similarities were due to the fact that Perlis and Penang used to be under the Kingdom of Kedah before the leasing of Penang Island to the English East India Company in 1786.

Kedah Malay is divided into four sub-Malay varieties namely Perlis-Pulau Langkawi, Kedah Persisiran, Pulau Pinang and north Kedah (Asmah, 2008). Apart from that, there are also other Malay varieties that were based on the neighbouring states namely *pelet Petani* and *pelet Siam*. These subsidiary branches of Malay had influence upon the Kedah Malay used in the districts namely Sik, Baling and Padang Terap derived from Kedah Persisiran sub-Malay. Since Thailand and Perak were the neighbouring areas of these places, it was to be expected that the influence of that variety of Malay could be seen here. Apart from that, the migration of the settlers from one place to another also contributed to the spread of one sub-Malay dialect on another sub-Malay. Evidence of this is based on the borrowed words in Baling taken from the North Perak Malay variety (Asmah, 2008). For example, in referring to the third party they (*mereka*), *dema* was used instead of *depa* although *depa* was employed in other parts of Kedah. *Dema* was actually widely used in north Perak.

The idea of sub-regions was also introduced by Asmah (1982). Sub-regions was used to explain the existence of Malay in areas that had certain similarities though not entirely uniform in terms of phonology (Asmah, 1982). In Kedah, there are five sub-regions that falls under Kedah Malay:

a. The plains, covering the area starting from Perlis in the north, up to Bandar Baharu in southern part of Kedah, from the coast inland up to the towns of Kuala Nerang, Baling and Sik

b. Pulau Langkawi

c. Pulau Pinang

d. Bandar Baharu (Kuala Kangsar)

e. The border area of the north from Padang Besar, up to the districts of Padang Terap and Sik

Other notable work on Kedah Malay was by Collins (1996) who examined the spread of Kedah Malay, and found that it had been used as their mother tongue in two villages in Pulau Sumatra. This study focused on four important aspects: the mapping of Kedah Malay, the comparison of Kedah Malay and 'sea gypsies' language *(Bahasa Orang Laut),* sea gypsies *(Orang Laut)* as well as summary of the study. However, in this study Collins (1996) proposed the idea of the spread of Kedah Malay to a larger territory, namely, Indonesia. The evidence was based on the hypothesis that Kedah used to be the centre for business trading and religion. He also proposed similar linguistic features between Kedah Malay and the sea gypsies' language (Bahasa Orang Laut) based on the syntactic systems, phonetics, lexical items and morphology. Collins (1996), for example, found four similarities between Kedah Malay and Bahasa Orang Laut. The first aspect was on the derivation of high vowels. The derivation of high vowels also exists in other languages. For instance, in the ancient Malay language *Bahasa Melayu Purba*, Collins (1996) commented on the ancient Malay language where /i/ was derived to become two phonemes [i] and [e] while [u] was expanded into [u] and [o].

Asmah (1982), on the other hand, has focused extensively on the sub-regions of Kedah Malay. The language spoken on the plains was considered the true standard of

Kedah Malay as it was employed in particular areas resided by the royals as well as being the administrative centre of the government. The area included Seputeh, Perlis, Kuala Nerang, Kuala Kedah as well as Anak Bukit. Most importantly, Asmah (1982) stated that other speakers from other regions, (ii), (iv) and (v) attempted to employ and conform to the language spoken on the Plains. The differences with Pulau Pinang sub Malay on the other hand was in the presence of the alveolar trill /r/ in two positions namely intervocalic and prevocalic positions.

However, previous research on Kedah Malay focused on other aspects such as syntax and lexis. Some research has been done on the pronunciation in Kedah Malay, especially the vowels but these researches are dated and based on impressionistic methods (Abdullah Hassan, 1966; Abdul Karim Ismail, 1971; Osman Omar 1987). Osman (1987) studied the Kedah Malay dialect spoken in Sungai Petani, while Abdullah (1966) compared the phonology of Kedah and Perak Malay. Abdul's (1971) research was on Baling Malay. Abdullah (1966) focused on the differences in the phonetic properties between Kedah Malay and Perak Malay. In his research, he suggested that there were four front vowels similar to what was described by Asmah (1987). However, the number of the participants was extremely small, which he acknowledged. He further mentioned that it would only be a comparison of the Malay in Alor Setar and Kuala Kangsar respectively as participants were originally from these places. There is therefore, an urgent need for current research on the vowels of Kedah Malay. This new research would add to the body of knowledge in the study of Kedah Malay as well as the acoustic study of its monophthongs.

1.4 Objectives

Given the limited research on Kedah Malay sounds from an acoustic perspective, this study aims to do the following

a. To describe the monophthongs of Kedah Malay based on acoustic analysis of their formants.

b. To compare the monophthongs of Kedah Malay and Standard Malay based on their formant values.

1.5 Research questions

This study aims to answer the following research questions:

a. What are the features of the monophthongs of Kedah Malay based on their formant values?

b. What are the similarities and differences of Kedah Malay and Standard Malay monophthongs based on their acoustic properties?

1.6 Limitations of the study

This study focused on the description of monophthongs of Kedah Malay only. The participants in this study were all female from only one district in Kedah namely Kuala Muda. They were all from the same place as it was hypothesized that they would all be using the same variety of language. Comparable sample of female speakers who speak Standard Malay were also included to facilitate comparison. As for Standard Malay participants, they were also from one area which was the Klang Valley.

The quality of the recordings may not be that excellent in this research as they took place in participants' respective homes instead of in a laboratory. Although a few precautions were taken to ensure quality of the recordings such as the room being either carpeted or with soft furnishing to reduce echo, there environmental noise such as people talking to each other, the sound of vehicles and so on.

1.7 Summary

The following chapter will discuss the literature related to this study. Chapter 3 describes the methodology used and Chapter 4 presents the findings and discussion of the research. Chapter 5 discusses the conclusion to the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Kedah Malay

Standard Kedah Malay used to be called *Kedah Persisiran* as it was employed largely from Kangar up to Taiping and from the coastline to Baling (Asmah, 2008). The variable that allowed the spread of this Malay was due to the ease of communication between the neighbouring states as there were no topographical hindrances between the two. In addition, it was largely utilised as the status symbol of Alor Setar as the capital city of Kedah, the strategic location of Sungai Petani in south which also had a higher population as well as the status of Kangar, the capital city for Perlis (Asmah, 2008). Osman (1987) has also conducted studies in Sungai Petani in order to examine the Malay language and its association with its surroundings. Although it adopted a sociolinguistic framework, the data and the literature were relevant to the current study and should be employed to better understand the features of Kedah Malay. In this descriptive study, the focus of the research was to compare the use of Malay in formal and informal settings. Asmah (1987) conducted field research by recording the lessons while the teachers were delivering them. Later, these lessons were transcribed phonetically, and it was found that the teachers used a mixture of Kedah Malay and standard Malay during the sessions. It was also found that the use of Kedah Malay was distinct in the teaching process. The other set of recordings were done outside classroom in order to provide a comparison between formal and informal settings.

In his study, Osman (1987) proposed the existence of a seven-vowel system in Kedah Malay which later would be beneficial in scrutinising and examining the topic at hand. The seven vowels are [i], [e], [a], [u], [o], [ɔ] and [ɛ]. Based on the data gathered, Osman (1987) described the vowels and consonants together while explaining the production and its distribution in both formal and informal conversations. At the end of the study, Osman (1987) concluded that the sub Malay variety in Kedah Persisiran

was not affected by the Thai language or other sub Malay in the east area which was affected by Kelantan Malay. In relation to formal and informal situations, it was found that the use of the formal variety, which was standard Malay in Kedah, was based on the 'a-variety'. As for the consonants, there were distinct phonemes that provided differences between formal and informal settings and they were the alveolar flap /r/, fricatives /s/ and /h/ and lateral /l/. In conclusion, the teachers assumed that it would be more convenient to deliver the lesson and communicate with the students while employing this Malay version instead of the Standard Malay.

2.1.1 Vowels of Kedah Malay

Asmah (1977) states that there is an eight-vowel system in Kedah Malay, which is similar to Perak Malay. This is in fact bears similarities with a later study conducted by Osman (1987) except that, Osman (1987) detects only seven vowels in Kedah Malay, as there is no [ə] in his findings. The eight vowels in Kedah Malay as proposed by Asmah (1977) are [i], [e], [a], [u], [o], [ɔ], [ə] and [ɛ]. Asmah (1977) deduced that the vowels of Kedah Malay are based on the older form of Malay which has a six-vowel system. Due to developments and change in the previously used system, there are two additional vowels in Kedah Malay. These two vowels are [ɛ] and [ɔ], which are front and back vowels.

Teoh (1994) also proposed vowel inventory for Kedah which he referred as north eastern/north western Malay. In this set of vowels, he combined the north-eastern Malay and north-western Malay pronunciation. North eastern here refers to the Malay language spoken in Kelantan and Terengganu while North western refers to Malay spoken in Kedah. Due to that, there are 11 vowels altogether but he did not specifically mention which vowels belong to which states. Consequently, the previous work of Asmah (1977) is used to affirm the vowels in Kedah Malay.

However, there are few differences in the vowels suggested by Teoh (1994) in comparison with the work of Asmah (1977). Asmah (1977) proposed eight vowels in her study, but there are more vowels in Teoh's (1994) treatise. However, the other three vowels could belong to the other states in north western Malaysia such as in Kelantan and Terengganu. His work was more general as he did not specifically classify which vowels belong to which states but rather concentrated on combining them under the same umbrella, namely north-western Malay. In a more recent work, Asmah (1993) further exemplifies the differences between Kedah Malay and Standard Malay. Here are the following examples from Asmah (1993, 192-193);

- The sound /a/ in Kedah Malay (KM) is maintained, while /a/ in Standard Malay (SM) is articulated as /ə/

  SM [apə] and KM [apa] – *what*

- -el in word final syllables of SM is articulated as /ɛ/ in KM

  SM [ʧomel] is articulated as [ʧomɛ] in KM

- -il in word final syllables of SM is articulated as /e/ in KM

  SM [katil] is articulated as [kate] in KM

Yunisrina Qismullah Yusuf (2013) also provided information on Kedah Malay monophthongs in her study on vowels in the Acehnese language spoken in Kedah and Aceh. In this study, she focused on both monophthongs and diphthongs of the Acehnese language. Her research was based on Asyik's work (1987). There are ten monophthong vowels which are [i], [e], [ɛ], [ə], [a], [ɯ], [ʌ], [o], [u] and [ɔ] based on Asyik (1987) as cited in Yunisrina (2013). In this research, there were two speaking contexts employed by Yunisrina (2013) in order to extract the data; they were target vowels that are embedded in words from the interview and target vowels that were embedded in the wordlist. Her findings showed that most of the vowels produced by participants from Aceh were maintained by the participants in Kampung Aceh's (KpA). There were few

differences between the two groups where the sound of [ʌ] was not produced by KpA participants, [ə] was pronounced in a similar manner closer to [ɵ] and a new sound of [ɑ] was found in the interview context in their Acehnese. She also included additional analysis on Standard Malay and Kedah Malay. It was found that the monophthongs that were maintained by KpA participants could be attributed to the shared qualities in Standard Malay and Kedah Malay vowels. Those vowels are [o], [a], [i] and [e]. Both sounds of [ɔ] and [ɛ] were produced in a similar manner as Kedah Malay vowels. Yunisrina (2013) measured 108 elicitation tokens, where 72 were tokens for eight monophthongs and the rest were for four diphthongs. Figure 2.1 displays the plot of formant average values for Kedah Malay monophthongs.
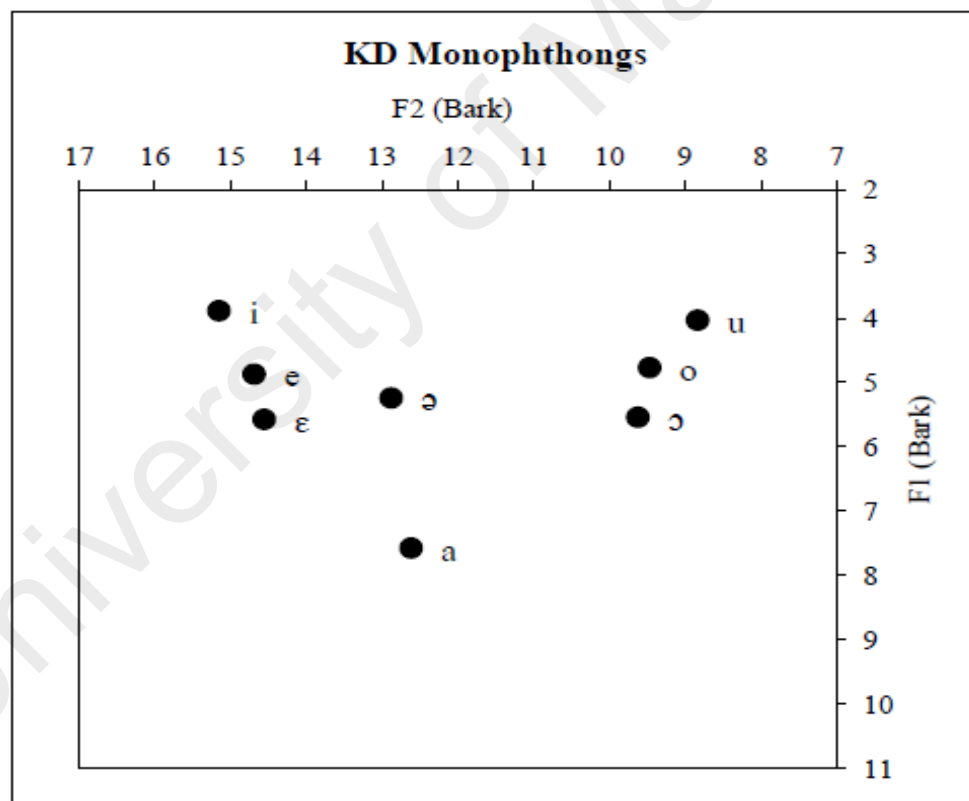

Figure 2.1: Plot of formant average values for Kedah Malay monophthongs, reproduced from Yunisrina (2013, 280)

The number of monophthongs correlated with Asmah (1977); eight monophthongs altogether: [i], [e], [a], [u], [o], [ɔ], [ə] and [ɛ]. In terms of location, this is almost similar to the vowels suggested by Teoh (1994), except for [a] as [a] in

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Yunisrina's (2013) was at open, central location while Teoh's (1994) [a] was in open, front position. Both works, Asmah (1977) and Yunisrina (2013) were complementary to each other as Asmah (1977) has provided the monophthongs in Kedah Malay; the same vowels are found in Yunisrina's (2013) work. Further, Teoh (1994) also confirms the location of the vowels in Kedah Malay on the vowel quadrilateral.

2.2 Standard Malay

Asmah (1971) has also commented extensively on Standard Malay. Standard Malay in this research will act as a comparison for Kedah Malay but the focus would be more on Kedah Malay. Asmah (1971) posits that there are two varieties of Standard Malay, namely /a/ variety and schwa-variety. The schwa variety is employed particularly in the southern and central parts such as in Negeri Sembilan, Selangor, Melaka, Pahang, Perak, Terengganu, Kelantan and Johor while the *a* variety prevails in both states of Malaysian Borneo like Sabah and Sarawak, as well as in Kedah, Perlis and Penang in Peninsular Malaysia. These variations are used in their respective geographical distribution, both in formal speech and in schools (Asmah, 1977). Both varieties differ in terms of the pronunciation of the phoneme /a/ and /r/ in the final position. As for the schwa-variety, as the name suggests, /a/ at the final position is pronounced as [ə] while the orthographic 'r' is not pronounced (Asmah, 2008). Here are few examples:

Schwa variety:

- baja [bajə] 'fertiliser'

- apa [apə] 'what'

- besar [bəsaɵ] 'big'

- bakar [bakaɵ] 'to burn'

The 'a' variety conforms to the spelling of Malay which means that it is pronounced the way it is written. The following are two examples:

- baja [baja] 'fertiliser'

- apa [apa] 'what'

On the other hand, the schwa-variety makes an exception for some of words, where the 'a' in final syllable is not changed to schwa and is pronounced as [a]. Some of the words are *bumiputera, wanita, bola, wisma, anda, jantina* and *pola.* Eventually, due to the expansion of the Malay vocabulary, the exceptions are increasing in number.

Teoh (1994) described Standard Malay as a "widely spoken language of Malaysia" (Teoh, 1994, 5). He further wrote that the term 'standard' in standard Malay refers to variety of language which is also in tandem with the previous research by Asmah (1971). He expressed the same ideas on the variety of standard Malay as Asmah (1971) and Yunus Maris (1980) where standard Malay is employed in formal situations such as in education, administration as well as in mass media. However, there are discrepancies on the notion of Standard language and varieties based on the field work of Idris Aman, Mustaffa Rosniah, Zaharani Ahmad, Jamilah Mustafa and Mohamad

Fadzeli Jaafar (2011). They conducted a field research in a number of states in Malaysia and concluded that the standard accent that refers to schwa variety was realized more by the informants compared to the non-standard accent. This accent is employed in formal conversations and in government official media (Radio Televisyen Malaysia), government sectors, as well as educational institutions. It was found that 71.4% participants used a standard accent and 28.6% a non-standard accent. The concluding remarks on this finding were that the subjects in the survey were 'brilliant' since they could accommodate using standard accent in formal situations.

As mentioned earlier, Asmah (1977) on the other hand, has a different idea on what is considered standard language and proposed the idea that there is not one, but two standard varieties in Malaysia: *a* variety and schwa variety and both "varieties are accepted as the norm for good language usage" (Asmah, 1977, 2). She further stated that both are standard in their respective states. Due to this, it can be summarised that there are actually two phonemes, [a] and [ə] in the schwa-variety. The schwa-variety is employed in the news on national television and over radio stations. Currently, it is still employed by RTM even after their headquarters were moved to Kuala Lumpur (Asmah, 2008).
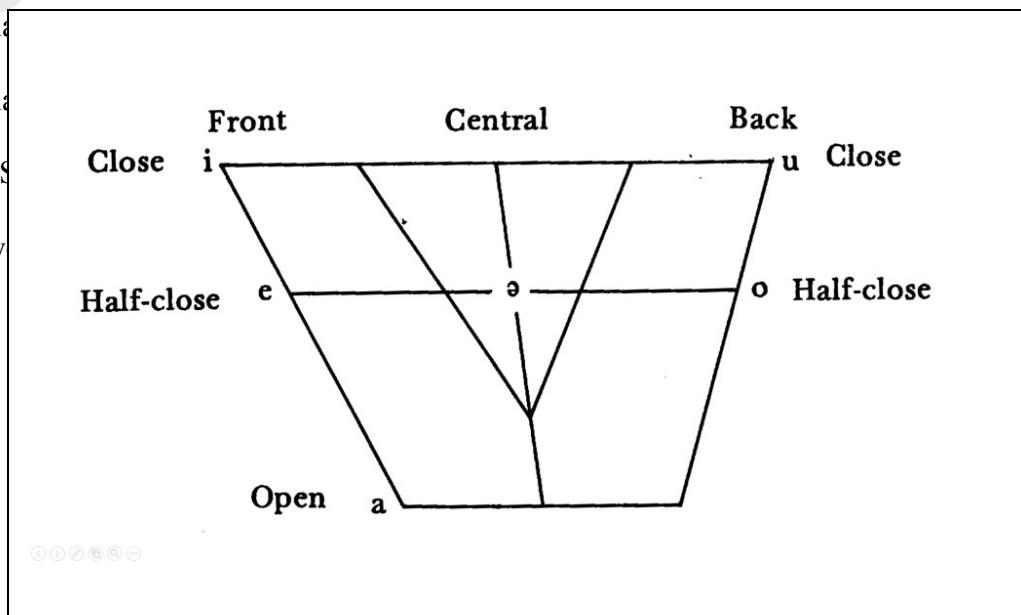
2.2.1 Vowels of Standard Malay

Yunus (1980) proposes six vowels in Standard Malay. His definition of Standard Malay... Standard Malay... that the S... of the vow...

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Figure 2.2: Malay Vowels by Yunus (1980, 2)

The same set of vowels is proposed by Indirawati Zahid and Mardian Shah Omar (2012) with the addition of three vowels, which are [ɛ], [ɔ] and [ɑ]. In this work, Indirawati and Mardian (2012) provided extensive explanation on the articulation and examples of words, paired with diagrams for the articulations of each sound. For instance, [i] is produced when the tip of the tongue is placed on the highest spot on the front part of the lips. The palate is raised close to the back of the throat closing the nasal cavity. Then the air will come out from the oral cavity while vibrating the vocal folds. During this stage, lips are spread and the tongue is at the highest spot in the oral cavity. Some of the examples of [i] are *ikan* [ikan], *bila* [bila] and *hati* [hati]. The same type of explanations is provided for the rest of the vowels. Examples for each vowel in Malay from Indirawati & Mardian (2012, 15) are as follows:

- [e]
  [hemah] hemah
  [pesta] pesta
  [sate] sate
- [ɛ]
  [ɛloʔ] elok
  [otɛ] (*modal* in Kedah malay)
- [a]
  [aku] aku
  [hati] hati
  [bila] bila

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- [u]
  [ulam] ulam
  [suka] suka
  [batu] batu
- [o]
  [obor] obor
  [mohon] mohon
  [soto] soto
- [ɔ]
  [bɔrak] borak
  [yɔga] yoga
  [tumpɔ] (passed away in Bota Perak dialect)
- [ɑ]
  [gulɑ] (gulai in Sungai Perak dialect)

- [ə]
  [ərat] erat
  [gəmar] gemar
  [cərah] cerah

The descriptions given are essential to the body of knowledge as they have provided information on place of articulations, manner of articulations, together with the diagrams.

2.3 Studies on other Malay varieties

In understanding the Malay language as a whole, evidence from other studies of Malay varieties can further provide clearer picture of it. In addition, they help to identify with the diachronic developments of other strains of Malay (Asmah, 1977). Other studies will provide information on how the Malay language is studied which will benefit the current investigation in terms of methodology.

One of the prominent studies on acoustic Malay is that of standard Malay of Brunei by Clynes and Deterding (2011). This study looked at the influences in level of education, age, gender as well as profession of the sociolects using standard Malay in Brunei. The researchers covered a number of phonological aspects including the

consonants, plosives and affricates, glottal stops, fricatives, sonorants, phonemic patterning and diphthongs including the one that is relevant to this current study, vowels.

Similar to Standard Malay, the vowels in standard Brunei are /u i ə e a o/. In this study, the subject is a newscaster, where the final /a/ is pronounced it as raised allophones as in the example of *sehingga akhirnya* [səhɪŋɡe ahirŋe]. The raising is possibly caused by the influence of schwa-variety of Malaysia (Clynes & Deterding, 2011). This study was not an instrumental study as it did not employ any devices in analysing the recordings. Rather, it provided descriptions on the phonological properties of standard Brunei. However, the findings on vowels were still beneficial for the current study as it can be compared with Standard Malay as well as Kedah Malay, particularly their positions in the vowel quadrilateral. Clynes and Deterding (2011) placed Standard Brunei Malay vowels on a vowel quadrilateral or chart (see Figure 2.3).
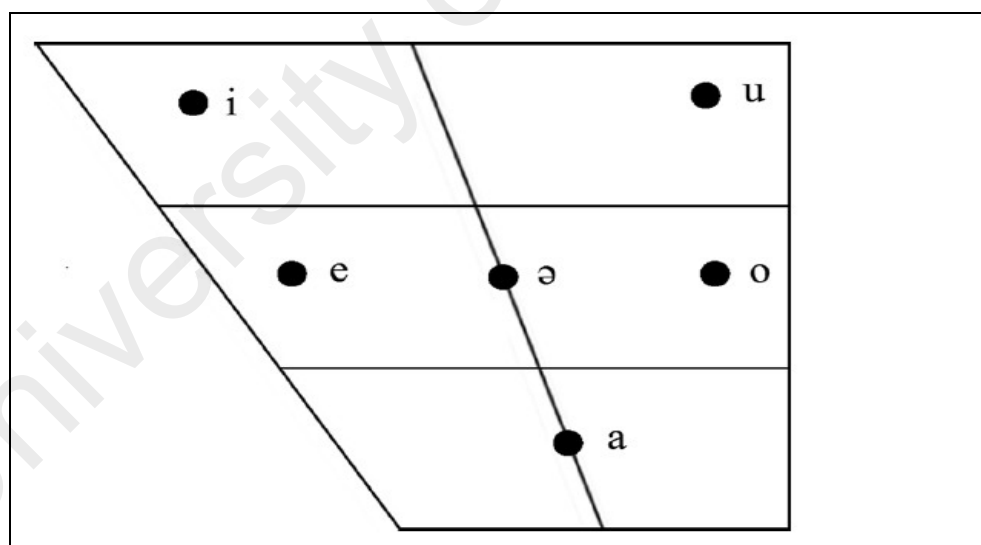

Figure 2.3: Standard Brunei Malay vowels from Clynes & Deterding (2011, 263)

The same set of vowels is also found in Indonesian vowels. Zanten and Heuven (1984) cited the work of Crothers (1978) on vowels in Indonesian Malay which consist of [i e a o u] and [ə] which is a central vowel sound. These vowels are the similar

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vowels found in Brunei Malay and Standard Malay as well. Figure 2.4 displays the vowels and their positions on the vowel quadrilateral based on Crothers (1978) as cited by Zanten and Heuven (1984).

	front	central	back
high	i		u
lower-high			
higher-mid	e		o
mid		ə	
lower-mid			
higher-low			
low		a	

Figure 2.4: The positions of the Indonesian vowels by Crothers (1978) as cited in Zanten and Heuven (1984, 56)

This set of vowels was employed by Zanten and Heuven (1984) in their research on "The Indonesian vowels as pronounced and perceived by Toba Batak, Sundanese and Javanese speakers". This study was a cross dialect study on vowel perception of Bahasa Indonesia. The three vernacular dialects, Toba Batak, Javanese and Sundanese were compared in this research. This study made reference to the six-vowel systems of Standard Indonesia similar to the dialect of the Javanese. It differs with Toba Batak in terms of the lack of a central mid vowel, while Sundanese has two central vowels (Zanten & Heuven, 1984). The study focused on the pronunciation and perception of Indonesian vowels by Javanese, Sundanese and Batak speakers. Apart from describing the vowels, this study compared standard Indonesian and the dialects of Sundanese and Batak. This shares the same secondary objective with the current research as it attempts to see the differences between Kedah Malay and Standard Malay. Zanten and Heuven (1984) cited the work of Trubetzkoy (1929) on the position of closed central vowel and Teeuw (1978) on the perception of the vowels. They also conducted two experiments;

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the first on the production and the second was on the perception. In the first experiment, the participants were instructed to read sentences in Indonesian. They were all 13 males from three different regions; four from Toba Batak, five Javanese and four Sundanese. All of them were university students or postgraduate students in the Netherlands except for one participant. All of them speak their regional language as well as English or Dutch. The vowels examined in this research were all monophthongs [i, e, a, o, u]. The stimuli were presented to the subjects in random order five times and they were instructed to read the words with the same intonation. As a precaution, Zanten and Heuven (1984) reminded the participants that the central vowel of Indonesian, schwa, is presented in /ə/ instead of /e/ to avoid confusion. The instructions given to participants were in Indonesian. The sentences were presented once on the screen; the next sentences would be presented once the participant managed to finish reading it without making any mistakes.

The experiment suggested that the vowel space of Javanese and Toba Batak pronunciations occupy smaller space compared to that of Sundanese speakers due to the closed realizations of /i/ and /u/. The vowel space of Toba Batak speakers was smaller when compared to the other two groups of speakers especially in the mid area. Zanten and Heuven (1984) also commented on the central vowel realizations. It was found that a Javanese central vowel realization was in a mid-position, where it was almost exactly half-way between /e/ and /o/. It also shows allophonic variation in sentences between *tetes* and *bebe* and *totok* and *bobo*. As for the Sundanese, the central vowel pronunciation is considered more closed. However, the central vowel for Toba Batak speakers was undiscernible due to the difficulties in articulating the central vowel. The speakers of Toba Batak in fact, pronounced it as /e/. Due to these findings, it is hypothesised that speakers of different varieties might produce monophthongs differently, which was also the basis of the current research, where speakers of Kedah

Malay might produce monophthongs differently compared to Standard Malay speakers. Based on the vowels found in Standard Malay, Brunei Malay and Indonesian Malay, it is conclusive to state that the vowels in the three varieties are the same vowels. Although there are additional vowels found in Standard Malay based on Indirawati and Mardian (2012), those vowels are more of dialectal differences, such as [ɑ] [gulɑ] (*gulai* in Sungai Perak dialect), [tumpɔ] (*passed away* in Bota Perak dialect) and [otɛ] (*modal* in Kedah Malay).

Another study which is equally important is on the vowel system of Sungai Muar, Johor, by Collins (1996) in the book entitled *Khazanah Dialek Melayu*. The focus of this study was on vowels specifically in the area of Sungai Muar as it played crucial role in business due to gold-mining and trading of forest products during the Malay sultanate as well as the colonisation era (Collins, 1996). Collins highlighted the factor that contributed to the development of pronunciation which was the emergence of Malacca as the new spot for colonisation. Another factor includes the murder of the royal family that contributed to the breakdown in communication between Malacca and Johor.

There are six oral vowels in Sungai Muar Johor consisting of two frontal vowels, two central vowels and two back vowels. As mentioned before on the schwa-variety, it shows that there is no significant contrast between these vowels compared to the vowels in the peninsular Malaysia version (Collins, 1996). The work of Collins (1996) is relevant to the current research because it is in parallel with the work of Asmah (2008) on the schwa variety which is inclusive of the states from Kuala Lumpur to Johor in the south. Therefore, it provides an idea of the vowels that might be produced by speakers of standard Malay later.

Collins (1996) also studied the vowels of Jugra. In this particular study, the area that falls under Jugra includes Permatang Buah, Gelanggang Buaya, Kelanang,

Katung, Sungai Arak, Bandar, Sungai Ingat at Mukim Bandar, Kampong Air Tawar, Kampong Sungai Rambai as well as Kampong Simpang Bandar in Telok Panglima Garang. The participants chosen for this study were all Malay participants. The findings suggested that there are seven vowels in Jugra Malay; /i/, /e/, /ɛ/, /a/ /ə/, /o/ and /u/. However, this was not the final version of the vowels and it still needs further investigation as Collins (1996) cites the work of Asmah (1977) where she claimed that there are six vowels in the south group including that of Selangor Malay. This study disproved the similarities of phonetics properties in Jugra and Selangor Malay (Collins, 1996). Although there are certain similarities between the two, it still has a significant difference that makes it distinct from one another. Collins (1996) cited Asmah (1977) on the similarity of Jugra Malay and Selangor Malay in terms of final vowels of /a/ that undergone changes and is pronounced as /i/. On the other hand, the prominent difference was the change of /ay/ to [-a]. In addition to that, in Jugra Malay both *-ay and *-aw is combined and [-a] is used. Due to this integration, evidence is provided on distinct features of Jugra Malay with other Malay including Johor Malay since there is an assumption on the similarities of Johor Malay and Selangor Malay (Collins, 1996). This research is essential in adding to the literature of the current research as participants of Standard Malay were going to be taken from Klang Valley, inclusive of both Selangor and Kuala Lumpur.

2.4 Vowel formants

The source filter theory focuses on speech production particularly at the last stage when the sound is articulated by the speakers. It is more concerned with the properties of particular types of articulation that correspond to particular sounds instead of the method of producing the articulation in the first place (Hayward, 2000, 79). Further, the source filter theory explains the differences in the production of the sound

since usually there are two stages that are involved (Hayward, 2000). Hayward (2000) clarifies the idea of sound production by using the analogy of the production of the sound by the violin which is a combination of the original source, which is the string and the modification of the sound due to the vibration of the box. The modification here is the second stage that is also refers as filtering. In analysing the vowels in this research, the formant frequency model is used. The reason behind it is the first (F1) and second formant (F2) correspond to the speech organs (Kent & Read, 2002). F1 corresponds to the vowel height and F2 corresponds to the retraction or advancement of the tongue.

2.5 Other studies on vowels

It is essential to include literature on vowels from other languages as it helps to comprehend the methodology employed for that research, and replicate certain aspects that would enable researcher to get better results, particularly if the focus of the research is on monophthongs. Few researches on vowels that are discussed in this section are Indonesian, Javanese and Toba Batak and Singapore English.

One of the prominent researches on Malay vowels is on the formant frequency of Malay vowels produced by Malay children by Ting, Zourmand, Chia, Yong and Badrulzaman Abdul Hamid (2012). This research was undertaken to discover the formant frequencies of sustained vowels in 360 Malay children aged between seven and 12 years. The acoustic analysis was based on both on male and female children. This research is important as it studied the vowels which are the focus of the current research. The relationship between age and vowel pronunciation among the children were also studied in this research. The participants were carefully selected from schools in Petaling Jaya and Kuala Lumpur, which are inclusive of 30 boys and 30 girls that are made up each group of participants. All of them were normal with no health issues or

allergies, a history of smoking, voice disorders and so forth to mitigate any possibility that might affect the recording.

The participants were asked to pronounce six sustained vowels, /a/, /ə/, /e/, /u/, /i/ and /o/ with sustained pitch and loudness for each vowel for 5 seconds. The recording device employed in this research was Shure SM58 Microphone with the distance fixed at 2-3 cm. The recording was carried out in a room and the speech sounds were digitally recorded by a Gold Wave digital audio editor. The sampling rate was fixed at 20 kHz with 16-bit resolution. A discrimination test was also conducted to check the pronunciation of the children where the listeners needed to listen intently to the pronunciation of the six Malay vowels. If seven out of the 10 listeners identified the vowels correctly, the pronunciation of the vowels would then be considered correct. This was an essential aspect in the research as it helped to validate the pronunciation of the vowels, which would subsequently help to obtain valid results. Subsequently, the average values of the first four formant frequencies were analysed with Praat.

In order to ensure precise measurements, standard settings were employed; five numbers of formants, 5500Hz for maximum formant frequency, dynamic range of 30 Db and 25 milliseconds for the window length. There is however, in some vowels an undefined fourth formant frequency at certain intervals of time. Next, in order to determine the significant differences of the formant frequencies, statistical analysis was conducted by SPSS.

Based on the analysis, it was found that there are significant differences across gender. The formant frequency of the Malaysian Malay girl was higher compared to that of boys. However, there are also exceptions in certain vowels sounds and age groups. For the differences across the vowels, it was found that there is a significant difference for both male and female children in all age groups except for the F4 of 12-year-old

girls. Stronger significant differences across the vowels were found in F1 and F2 compared to F3 and F4. As for the significant differences across the age groups, there was a significant difference in formant frequencies for all age groups for most of the vowels particularly F1 and F4 in girls and F1, F3, as well as F4 in boys.

It was found that the female frequency of young Malay girls was higher compared to Malay boys. It was expected that there would be difference in these two researches due to the gender variables. For that reason, only female participants are studied in this paper to keep the gender variables constant.

Another study on vowels was conducted by Deterding (2000) on English vowels. He reported that the speakers in Singapore had a tendency not to differentiate between long/short pairs of vowels. The measurements were focused on Singaporean Chinese speakers as they make up the biggest quota of the population in Singapore. This was cited by Deterding (2000) based on data in the Singapore Department of Statistics 2006. In this study, Deterding (2000) examined the monophthongs of Chinese, Malays and Indian speakers in Singapore. Although the focus of the research was on differentiating between long and short vowels, this study is crucial to be reviewed since the subject is still on monophthongs. In fact, at the beginning of the study, Deterding (2000) distributed questionnaires before the recordings as he wanted to get information regarding their age, gender, ethnic background, the languages that they speak, at what age they learned the language(s) and with whom they have been speaking the language(s) This was also done in the current research as it is necessary to know the background of the potential participants before including them in the study as there are criteria that they need to fill before being considered as participants. For instance, if they are not native speakers of Kedah Malay or their spouses are not native speakers of Kedah Malay, hence, they would not be chosen as participants in this

research. It is important to eliminate any possibility that the speakers might be influenced by other varieties of the language.

The subjects in this study were 43 female students studying in the same college. Before the recordings, they were asked to fill in the questionnaire. The study was based on the recordings of 41 participants. Out of 41 subjects, 25 were Chinese, 12 Malays and four Indians. The low number of Indian participants in this study was due to the distribution of the population in Singapore itself where Indians make up the lowest percentage of the population of Singapore. All participants were currently pursuing their bachelor's degree to become English teachers. All participants were highly competent in English. The age range of the participants was between 19 and 30 years. The participants were asked to read the 'wolf' passage. The longer version of this text was chosen as it worked better for the measurement of English vowels compared to the 'North Wind and the Sun' text that has been used for more than nearly one hundred years (Deterding, 2006). A similar approach is employed in the current research as participants were given sets of sentences to read. The recordings were done in the phonetics laboratory of NIE using CSL Software. After the recordings were completed, at least three tokens were measured for each of the eleven monophthong vowels of RP British English for each speaker. All the tokens chosen were to avoid preceding nasals as it may have an influence on the vowels examined.

In order to measure the first and second formants of the vowels, LPC Formant tracks overlaid on computer based spectrogram was used. Later the average formant values were plotted on a graph based on F1 against F2. F1 stands for the first formant which indicates the openness or closeness of the quality of the vowels while F2 represents the second formant that indicates the advancement or retraction of the vowels based on Ladefoged (2001). Next the values were converted to bark scale. The formula used is by Zwicker and Terhardt (1980). The Bark scale is "a nonlinear transformation

of frequency that is thought to correspond to the analysis accomplished by the ear" (Kent & Read, 2002, 301). The same steps are going to be replicated as both F1 and F2 have to be examined later in this research. The average values of F1 and F2 will also be converted to Bark scale to better represent the advancement or retraction quality of the vowels.

Based on Figures 2.5 to 2.7, there appears to be almost no differences between the three ethnic groups in Singapore in terms of their vowels. The main difference was based on the production of [ɜ:] as it is more fronted for Malays. In conclusion, there are no apparent differences of the vowels among Singaporean Chinese, Malay and Indians except for the case of /ɔ:/ and /ɒ/ that are closer together and /e/ and /æ/ that are more open.
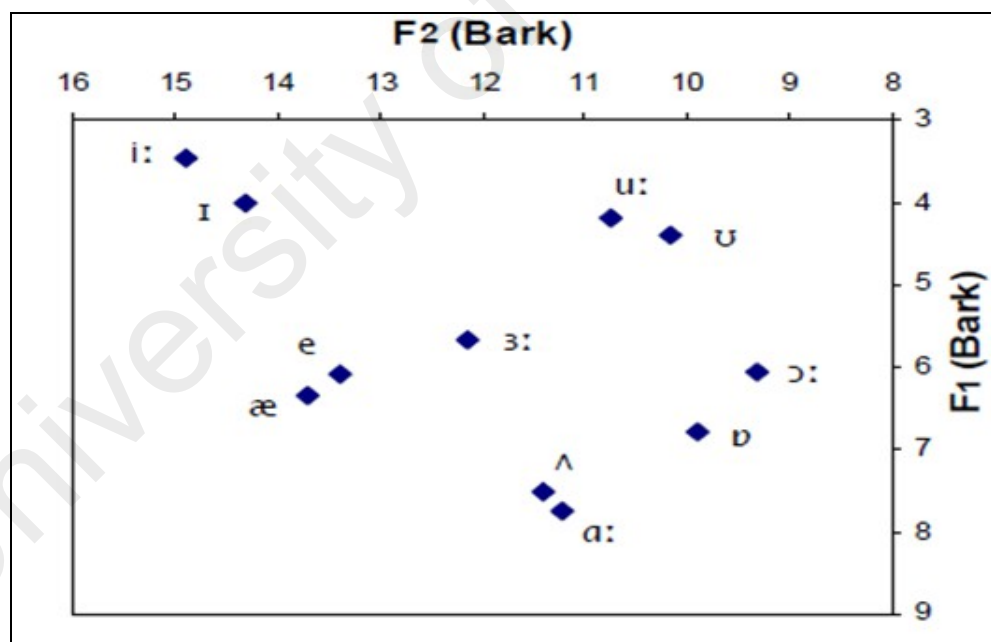

Figure 2.5: Vowel plot of F1 and F2 for the vowels of 25 Chinese Singaporeans by Deterding (2007, 9)
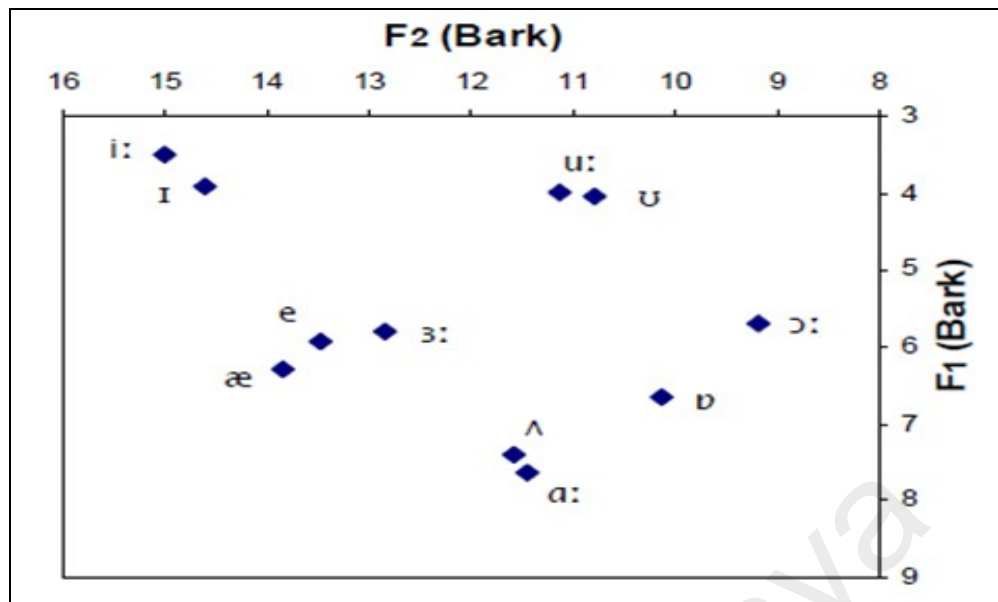
Figure 2.6: Vowel plot of F1 and F2 for the vowels of 12 Malay

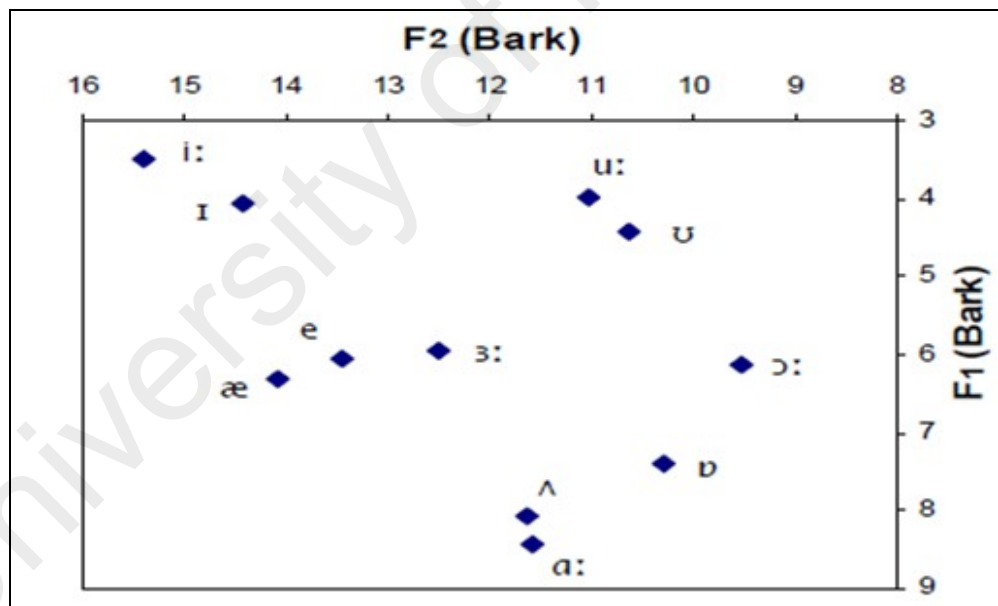**Singaporeans by Deterding, (2007, 10)**

Figure 2.7: Vowel plot of F1 and F2 for the vowels of 4 Indian

Singaporeans by Deterding (2007, 10)

Another research by Deterding (1997) was on the vowels of Standard Southern British English. In this study, he examined the pronunciation of the speakers in the production of vowels. The focus of this research was on the analysis of the formants since it provided a more precise perception of the vowels (Kent and Read, 2002). Due

to that, many studies focusing on formants as they are important in the phonetic properties of vowels, which is also the crux of the current research where the first (F1) and the second format (F2) will be examined. The subjects for this study were five men and five women. Only eleven monophthongs were measured and the subjects were BBC broadcasters. Their recordings were all included in the MARSEC database. The measurements from the MARSEC database were also used in this study in order to make a comparison so other researchers can further develop it or employ it as a benchmark for other upcoming study. Since these were recordings from the BBC, they represented a certain style of speech that may be familiar around the world to a certain extent (Deterding, 1997).

All the speakers employed Standard Southern British Accent, which is similar to Received Pronunciation (RP). However, Deterding (1997) clarifies that there are also slight differences among the speakers in terms of breathy voice, traces of a Northern accent and creaky phonation. The measurements in this study were made by using Computerised Speech Lab (CSL) Software from Kay PENTAX advanced speech analysis system running on a 486 PC (Deterding, 1997). The clear target vowels are identified and later the digital spectrograms are derived by employing linear prediction based formant tracks. The formants of each vowel are made and Deterding (1997) explains the possible problems that may arise in certain conditions and precautions that should be made. One of it is by avoiding the vowels that occur after the approximants such as /w/, /j/, /r/ or before /l/ due to the severe co-articulatory effects on the locations of the formants (Deterding, 1997). This is also again has been the same reason to avoid or minimise approximants in the vowels that are going to be presented later to the participants in the current study. The results were analysed and the average values of the first three formants were calculated. Later, these values were converted into auditory Bark scale. Deterding (1997) employed formula that is suggested by Zwicker and

Terhardt (1980) and it is also will be used in this research since it provided "good approximation of the actual frequency analysis performed by the ear" (Kent and Read, 2002, pp. 115). Those values then were plotted in order to get better representation of the formants in terms of the backness and frontness. The measurements from the MARSEC vowels can later be used as comparison with other research that employs connected speech.

Deterding (1997) further clarified the findings in term of peripherality and it may be expected for the citation vowels to be more peripheral when compared with connected speech due to the effects of co-articulation with neighbouring consonants. In addition to that, it is due to the expectation on the fluent speakers that may optimise their vocal effort in connected speech. Based on the measurements, it was found that the Bark value for connected and citation speech respectively is 2.04 and 2.57 for male and 2.81 and 2.90 for female. These figures suggested that the citation speech may be more peripheral yet it is only statistically significant for male and not female. Deterding (1997) emphasised that the findings in connected speech are more natural compared to the measurements of vowels from citation words. Since it was taken from standard database, the measurements and data from these findings could be used for upcoming research as a means to provide comparison as well as to monitor its accuracy.

Deterding (2003) also studied vowels of Singapore English and used recordings of five male and five female Chinese Singaporean students. These participants were all students from National Institute of Education in Singapore where they were in training to become school teachers later on. Since these were the only subjects employed in this study, the researcher addressed it as one of the limitations in terms of the representation of the sampling. A similar situation applies in the current study as the participants of Kedah Malay are all housewives, which might limit the representation of the sample to a larger population of Kedah Malay participants.

The subjects in Deterding's (2003) study were interviewed for five minutes each and they were asked questions about their activities during the last vacation and from there the researcher continued to proceed with other questions related to other topics such as their plans for the future and their previous trip abroad. Later on, the data were transcribed, and the monophthong vowels from the speakers were analysed. As for the comparison with Standard English, the vowels of British English from five female and five male BBC broadcasters from the MARSEC corpus were used (Roach et al 1993) as cited in Deterding (2003). The monophthongs are identified and the first two formants are measured by employing computer based spectrograms as well as overlaid LPC formant tracks. Ten vowels were measured for each subject. However, in certain cases the numbers of measured vowels were more. One of the precautions taken by the researcher was by avoiding the vowels following /r/, /w/ and /j/ in order to avoid assimilation as it will prevent from getting the real vowel as a result of severe co-articulatory effects of the formants. In addition to that, the vowels preceding a final /n/ or final /l/ were also avoided.

The analysis of the data shows that the values of F2 for the front vowels were lower. It may suggest that the vowels were slightly more central when compared with the conversational data considered here. The analyses were made based on the value of average formant frequencies for Singaporean monophthongs, formant plots and scatter plots. Based on this study it was found that there exists neutralization between /i/ and /ɪ/ as well as between /e/ and /a/. In addition to that the /uː/ of Singaporean speakers was also more back when compared to British speakers. However, these contrasts did not lead to the miscommunication among speakers.

Other than that, Deterding (2005) also studied the emerging patterns of Singapore vowels. In this study, Deterding (2005) specifically highlighted that minimal comparison was made with British English in order to further discover the patterns of

Singapore English. This was because in most cases the patterns could not be discovered by simply employing British English as the starting point of the study (Deterding, 2005). For this particular research, minimal comparison on Standard Malay was also going to be done for the same reason.

The participants in this study were 38 trainee teachers from National Institute of Education in Singapore (NIE). Of the 38 students, 30 of them are Chinese, seven are Malay and one is Indian. Although the division bases on ethnicity were imbalance, it actually represented the population of the Singaporean (Deterding, 2005). The subjects were all taking English as their chosen subject. Therefore, their level of English was generally good and it ranged from reasonably good to excellent. For most of the participants, English was their first language although they tend to use other language while at home or with friends, by using Malay or Mandarin. There were 12 sentences, and some of them were:

1. That beg with a blue peg on it has won a prize.

2. I wonder when that red dog will cease its attack

3. He's dead sure it can absorb those rays of the sun.

4. I have a vague plan for an adventure tour instead.

5. The man who led that raid maybe sees the result.

6. The best cure may consist of that race to adapt.

The sentences might not make sense but it provided different types of comparison especially on the properties of vowels. In addition to that, the sentences were constructed to allow the examination of comparison of duration on vowels. In order to make the comparison, five British speakers were recorded reading these sentences as well.

The findings in this study were discussed based on pairs of words. For instance, there were no differences of pronunciation were expected from the Singaporean

speakers for the vowels *bet* and *bat*, Therefore, the merged vowel was represented as /ɛ/ in this study. In order to further clarify the comparison of the close vowels, the first two formants of the vowels in the close pairs were measured. The vowels were embedded in these words; *egg, beg, peg, bed, dead, fed, bread* and *red*. The measurements were made on the recordings of 38 subjects altogether but the male values were not included as it may distort the data. Based on the analysis, it was found that there are two quite distinct vowels and the vowel in *egg* belongs to the same group of *vague* and not with *peg* or *begs*, except for one speaker.

Based on the overall examination of the vowels, it was found that the majority of Singapore speakers employed close vowels in the words of *dead, egg*, and *bed* and more open vowel in *bread, fed, peg* and *beg*. The researcher also indicated the problems in measuring the vowels for certain words such as the vowel embedded in the words of *won* and *want* because of the initial /w/ that caused "sharp dip in the second formant" (Ladefoged, 2003, 148). The examination of the vowel duration in this study on the other hand discovers that there was a small significant difference of the vowels in *cease* and *seize* ($t=2.6$, $df=37$, $p< 0.05$, paired-sample, one tailed) (Deterding, 2005, 32). The data indicated that Singaporean speakers at least made distinctions between the two vowels in the two words.

Generally, nearly all Singapore speakers observed the same closed vowel in *egg, bed* and *dead* while they used a more open vowel in *beg, peg, bread* and *fed*. Due to this consistency, it was suggested that another variant was established by Singapore speakers, which was quite independent of any external standard (Deterding, 2005). This idiosyncrasy did not allow this data to be interpreted with reference to British English or other external varieties of English. Other consistent features were discovered in this study. Some of them were the use of /ʌ/ in *want*, reduced vowel in the first syllable of *according, afford* and *abroad* and full vowel in other words. Most importantly, in

describing Singapore English, it did not necessarily fit into the framework used to describe older varieties of the language (Deterding, 2005).

Another research on vowels was a research conducted by Pillai and Yunisrina Qismullah Yusuf (2012) on Acehnese oral vowels. The subjects were ten female North Aceh dialect speakers and the average age of the subjects was 54 years with the age ranged from 45 to 60 years and the standard deviation of 5 years. The minimum level of education for all participants was secondary school. This group was chosen by the researchers because the younger generation tends to use Bahasa Indonesia instead of Bahasa Aceh. The other two criteria in choosing the subjects were the subjects need to be able to speak the North Aceh dialect fluently as their first language although they were fluent in Bahasa Indonesia and the subjects needed to use Bahasa Aceh in their daily encounters such as when conversing with their spouses, children and community members. These steps provided control of the validity of the data that was eventually gathered. The same reasons applied to the current research to ensure that the participants chosen for this study were native speakers of Kedah Malay and not influenced by other dialects.

Since this study was on oral vowels, it covered both monophthongs and diphthongs. In this research, ten monophthongs and twelve diphthongs produced by the speakers were analysed. The starting point for this research was based on the descriptions of vowels by Asyik (1987) as cited in Pillai and Yunisrina (2012). In this study, the subjects were shown pictures in order to elicit the target word. The words consisted of nouns and verbs containing the target vowels. Approximants, nasals and liquids neighbouring the vowels were avoided in order to reduce the co-articulatory influences. This was also performed in the current research for the same reason: to Later, a picture was shown to the subjects and the researchers endeavoured to elicit the

target words from them. If it did not work in first place, they would ask some probing questions which would hopefully be of help to the subjects.

The monophthong vowels were measured by taking the value of the first formant (F1) and the second formant (F2) at the midpoint of the vowel. This was another precaution taken by the researchers because this proved the least influenced of sounds as well as being the steadiest state of the vowels (Ladefoged, 2003). This was also accomplished in the current research. Next, PRAAT Version 4.6.12 (Boersma & Weenink, 2016) was used. Then the values of the formants in Hertz were converted into a Bark Scale and the average values on an F1 vs F2 chart were plotted (Deterding, 2007). The details on the analysis of diphthongs were also explained by the researchers but since this current study is on monophthong, the analysis of diphthongs will not be discussed here. All steps in the research by Pillai and Yunisrina (2012) were also replicated in the current research since they also concentrated on the description of the monophthongs.

Based on the analysis, the findings conformed to the descriptions provided by Asyik (1987) as well as other studies as cited in Pillai and Yunisrina (2012). This was the case for the three vowels of /i/, /e/ and /ɜ/. However, a slight difference was found in the position of the vowels where they are closer to each other. The position of /e/ and /ɜ/ were actually higher compared to the descriptions given by Asyik (1987) and Durie (1985) as cited in Pillai and Yunisrina (2012). The justifications for these differences could be attributed to the effect of the target words as well as the variability in the data (Yunisrina & Pillai, 2012). Other changes that were detected in Acehnese vowels were the fronting of the back vowels of /u/ and /ɔ/. These could be associated with the manner of the production of the target vowels and their phonetic environment (Pillai & Yunisrina, 2012).

Another study that examined vowels was a study by Pillai, Zuraidah Mohd Don, Knowles and Tang (2010) on vowel contrasts. This research was on the comparison between Malaysian English and Received Pronunciation and the distribution of Malaysian English in vowel space. Phonetic contrast between the two varieties were analysed in terms of traditionally paired vowels. The two research questions were addressed by analysing the monophthongs produced by the speakers. The participants in this study were 47 females who speak Malaysian English. The ethnic distribution of female speakers in this study were as follows; 10 Indians, 31 Chinese, five Malays and one Eurasian. The participants were all undergraduate students majoring in English. Non-random sampling applied in this research as the participants selected for this study were ensured to be proficient in English in order to maximise the validity of the subjects. This was also the same case in the current research where only female native speakers were chosen to participate in the research. Proficiency in English was expected as it was their specialisation. Only recordings of female speakers were employed in the analysis in order to maintain the gender variable consistency since male students majoring in English were too few. The comparison of male students and female students would not be valid as result.

The subjects were required to repeat the target words that were embedded in the CVC context. The vowels that were analysed in this study were extracted from these words; *bid, bead, beg, bag, bug, bard, pod, board, put, boot* and *bird*. At the end of the recordings, there were 517 tokens altogether correspondent to 47 tokens for each vowel.

The recordings were subsequently analysed using PRAAT version 4.4.20. F1 and F2 were analysed by using linear frequency coding (LPC) tracks, which later were plotted on the spectrogram in Praat. Prior to this, the researchers examined the auditory of the target words and visuals of formant tracks. Next, the average of F1 and F2 were calculated and the vowel plots were generated after the conversion of the values into a

bark scale (Zwicker and Terhardt, 1980). Based on the analysis, it was found that there was a lack of difference in the pronunciation of the paired vowels of /iː/ - /ɪ/, /e/ - /æ/ and /ʌ/ - /ɑː/. It was also discovered that the contrasts between back vowels are larger: /uː/ - /ʊ/ and /ɒ/ - /ɔː/. These findings are in tandem with the previous research by Salbrina Sharbawi (2006) and Deterding (2003) on Brunei and Singapore English respectively. A slight difference was on the vowels of /ɒ/ - /ɔː/ where they show less contrast. This study showed that Malaysian English occupied a smaller vowel space compared to British English. Also, the mean formant values were also contrasted when compared with other researches from Singapore English, Brunei English and Received Pronunciation.

2.6 Summary

The first part of this section described the historical background of Kedah Malay and vowels of Kedah Malay. It also examined the pronunciation of vowels of Kedah Malay by other researchers. Standard Malay vowels are also described to provide background information for both varieties. The second part of the section focused a number of studies on monophthongs. The following chapters describe the methods used in this study.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used in this research in order to collect and analyse the data. Details regarding participants, instruments, and tokens are also discussed in this chapter.

3.2 Participants

Eight participants were selected for this research. Five participants are speakers of Kedah Malay and three participants are the speakers of Standard Malay. These participants were carefully selected by distributing questionnaires to them to obtain information regarding place of birth and the number of years they have been living in a particular state, their occupations and level of education. The reason behind this was to ensure that they are native speakers of Kedah Malay and to ascertain that they have been staying in Kedah since birth. Questions on level of education and occupation were also asked in order to better represent the sample. This was also the same situation when Deterding (2003) conducted research on a group of Singaporeans that employed high variety as they were all university students, which might limit the findings to this group only, rather than others using colloquial English. The same questionnaires were given to their respective spouses. This was necessary to ensure that they were not influenced by the language of their spouses.

Based on the questionnaires given, three participants from the Klang Valley area who speak Standard Malay and five participants from Kedah who speak Kedah Malay (KM) were chosen for this research. For Kedah Malay participants, all of them were housewives from the district of Kuala Muda, and were native speakers of Kedah Malay. Their spouses were also from Kedah. For the Standard Malay (SM) participants they had lived in the Klang Valley throughout their lives. Two of them work in the private sector and one of them was in government service. The participants from the Klang Valley were selected because it was hypothesized that they are not influenced by other dialects because Standard Malay is based on the Johor-Riau dialect, the dialect

spoken in the southern part of peninsula Malaysia such as Johor, southern Perak, Melaka and Selangor (Teoh, 1994). Both groups of participants were aged between 45 to 70 years with an average age of 57 years old.

3.3 Tokens

The participants were given a set of sentences to read without being informed what the target tokens were in order to ensure that they were not affected by the need to correct themselves. They were asked to read the sentences naturally. The text contained four sentences, one for each token. There were 32 target tokens altogether examined in the study. Eight vowels that were measured in this study were [a], [ɛ], [i], [o], [u], [ɔ], [e] and [ə] for Kedah Malay. For Standard Malay, the speakers were asked to read the same sentences. This was to examine how the vowels in target words were produced in Standard Malay. The vowels chosen were placed in between consonants avoiding vowels that occur after the approximants such as /w/, /j/, /r/ or before /l/ due to the possible co-articulatory effects on the vowels (Deterding, 1997).

The following are the sentences used for the research and both groups of participants were asked to read the same set of sentences. The underlined and bold vowels are the target vowels.

/a/

1. Ayah b**a**kar sampah di belakang rumah.

2. Kita perlu t**a**bah menghadapi cabaran dalam kehidupan.

3. Adik j**a**tuh ketika bermain di sekolah.

4. Dia baling b**a**tu ke dalam kolam.

/i/

1. Dia membeli k**i**pas meja untuk kegunaanya di bilik.

2. Ibu beli kain bat**i**k ketika melancong di Kelantan.

3. Dia cuba p**i**kat gadis yang cantik itu.

4. Burung p<u>i</u>pit gemar hinggap di dahan itu.

/u/

1. Ibu bapa perlu p<u>u</u>puk minat anak-anak untuk bersukan.

2. Fikirannya k<u>u</u>sut apabila mengenangkan masalah itu.

3. Dia akan tiba p<u>u</u>kul empat petang nanti.

4. Ibu beli b<u>u</u>tang baju di kedai .

/ɛ/

1. Emak memasak sup <u>e</u>kor petang tadi.

2. Adik main bola s<u>e</u>pak di padang.

3. Dia membela tiga <u>e</u>kor kucing.

4. Tulisannya elok dan kemas.

/ɔ/

1. Dia suka makan s<u>o</u>tong dan ayam.

2. Ibu ingin menanam lebih banyak pok<u>o</u>k di laman belakang rumah.

3. Tidak baik p<u>o</u>tong percakapan orang tua-tua.

4. Kerajaan siasat dakwaan peniaga s<u>oro</u>k ikan.

/ə/

1. Dia akan tiba p<u>e</u>tang nanti.

2. Abang ke kedai p<u>e</u>tang semalam.

3. Rancangan itu akan bermula pada pukul tiga p<u>e</u>tang nanti.

4. Ayah minum kopi p<u>e</u>tang tadi.

/e/

1. Kawasan yang bersih itu merupakan satu cerminan h<u>e</u>mah dan budi tinggi

   penghuninya.

2. Adik suka makan sat<u>e</u> kambing.

3. P<u>e</u>sta itu diadakan di kawasan lapang.

4. Dia ke p**e**sta bersama kawan-kawannya.

/o/

1. Ibu masak s**o**to pagi tadi.

2. Dia cuba m**o**hon maaf dari kakaknya.

3. Ratusan orang berbaris di jalan-jalan utama bagi menyaksikan penyerahan **o**bor di stadium.

4. Burung gemar hinggap di dahan p**o**hon itu.

3.4 Data collection

The participants were recorded reading the prescribed sentences. They were asked to read the sentences the way they converse with each other on daily basis using Kedah Malay. Granted that this was not a naturalistic setting for them to use the dialect. However, speakers managed to use the Kedah Malay dialect when carrying out this task. The recordings were made in a quiet room in each participant's house. The rooms were carpeted, and this helped to minimise echo. An HP laptop Pavilion g4 and HP Headset H1500 Single Plug with a built-in microphone used. The microphone was placed between 2 to 3 cm from the mouths of the participants. The software used for the recording was Praat version 4.4.20 (Boersma & Weenik, 2016). The recordings were set to mono with a sampling frequency of 22050 Hz as suggested by Ladefoged (2003).

3.5 Data analysis

After the recordings were carried out, the sentences and words were transcribed using the TextGrid function in Praat. (see Figure 3.1). Later the selected vowels were measured. The first (F1) and second formants (F2) were measured by using Praat, and these measurements were recorded on a spreadsheet. As explained in Chapter 2, The F1

and F2 were measured because F1 corresponds to vowel height and F2 corresponds to the retraction or advancement of the tongue. As shown in Chapter 2, most studies use the formant frequency model to analyse vowels. Similar to Yunisrina and Pillai (2012), the monophthong vowels were measured at the midpoint of the vowel. This was done as it was the least influenced sound and the steadiest state of the vowels (Hayward, 2000). Again, similar to Yunisrina and Pillai (2012), the values of the formants in Hertz were converted into Bark scale because "it is thought to be a good approximation of the actual frequency analysis performed by the ear" (Kent and Read, 2002, 115). The formula that was used was:

$$13 \arctan(0.00076f) + 3.5 \arctan((f/7500)^2)$$

$$\boxed{Z = 13 \arctan(0.00076F) + 3.5 \arctan(F/7500)^2}$$

Reproduced from Zwicker and Terhardt (1980, 25)

The measurements of each vowel from each participant are listed in Appendix A. The average values in Bark were placed and transformed into a F1 vs F2 chart. The average measurements and standard deviations for Kedah Malay and Standard Malay were also computed.

3.6 Statistical analysis

Independent samples t-test were also carried out on the values of F1 and F2. T-tests were carried out to examine the difference of each token between Kedah Malay and Standard Malay in terms of vowel height and vowel advancement/retraction.

CHAPTER 4: FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, findings from the research will be presented and discussed. Both results from Kedah Malay and Standard Malay will be discussed separately and

subsequently compared. Discussion on Kedah Malay would be in detail as it is the gist of this study while Standard Malay will be discussed as a comparator.

4.2 Findings on Kedah Malay monophthongs

The values of averages for F1 and F2, values of F1 and F2 in Bark for Kedah Malay monophthongs are presented in Table 4.1. The measurements for each of the vowels are presented in APPENDIX B.

Table 4.1: F1 and F2 averages for Kedah Malay monophthongs

Tokens	Ave F1 (Hz)	SD	Ave F2 (Hz)	SD	Ave F1 (Bark)	Ave F2 (Bark)
i	382	22.41	2381	501.03	3.68	14.07
e	474	24.89	2262	324.17	4.51	13.82
ɛ	529	66.41	2234	579.33	4.98	13.57
ə	513	51.77	1692	195.38	4.84	11.96
a	703	37.37	1665	178.78	6.40	11.86
o	553	79.15	1093	116.29	5.18	9.06
ɔ	561	52.67	1164	53.64	5.25	9.50
u	416	29.92	1125	117.14	3.99	9.25

Ave = Average
ms = milliseconds
SD = Standard Deviation

Figure 4.1 displays the vowels of Kedah Malay monophthongs on a vowel quadrilateral. Based on the findings, there are eight vowels in Kedah Malay and it is in accordance with Asmah (1993). There are few similarities and differences of the location of the vowels with the one suggested by Teoh (1994). First, the locations of /i/ and /e/ are almost parallel with location of /i/ and /e/ by Teoh (1994) although it differs slightly for /e/ as /e/ in this research is slightly away from the front position. In fact, it is also parallel with the findings of Yunisrina (2013) as her /i/ and /e/ are in close, front

position and half-close, near front position respectively. Similar goes to position /ɛ / as it is located at front, close-mid position. The positions for /u/ differs with Teoh (1994) and Yunisrina (2013) in terms of frontedness since /ʊ/ in this research is moving towards central position instead of in close, back position. The locations of /o/ and /ɔ/ in this study are close to each other, just like finding in Yunisrina (2013) but it differs slightly for /ɔ/ in this study is moving slightly towards central instead of at the back. The location of /o/ is also in accordance with Teoh (1994). No comparison could be made with /ɔ/ as it is included in Teoh's (1994) finding.

The vowel /a/ in this research is positioned in similar location with Yunisrina (2013) but not Teoh (1994) as /a/ in Teoh (1994) is located at open, front position instead of open, central position. Finding of /ə/ is similar with both findings from Yunisrina (2013) and Teoh (1994) as it is located at a half-close, central position. This is expected as /ə/ is a central vowel (Yunus, 1980).
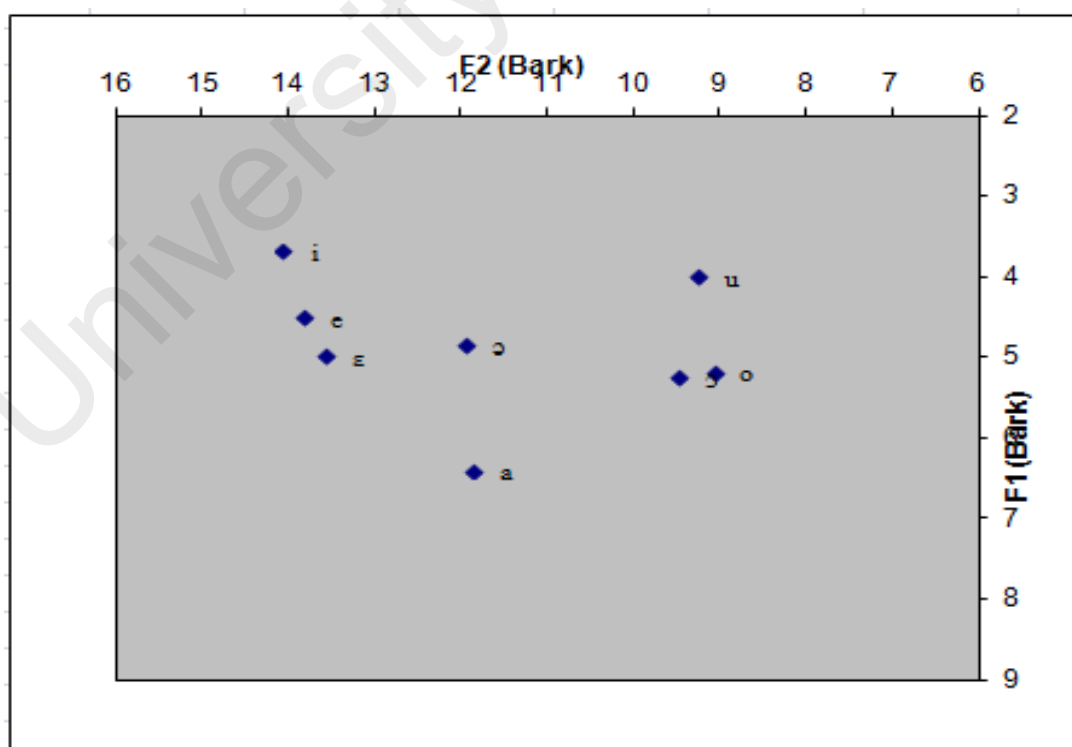

Figure 4.1: Vowel plot of Kedah Malay monophthongs

4.2.1 Kedah Malay /a/

Figure 4.2 shows the scatter plot of /a/ and that there is an overlapping distribution of the vowels /a/ among the participants of Kedah Malay except for a deviation by KM 2 and KM 4 where it is moving towards a half-close, back position. The distributions of /a/ among KM participants in this research are moving towards half-close, near front position, instead of open, central position of /a/ in Yunisrina's (2013). Other than that, /a/ in this research are more scattered compared to /a/ in Yunisrina (2013) where the distribution is closer to each other.
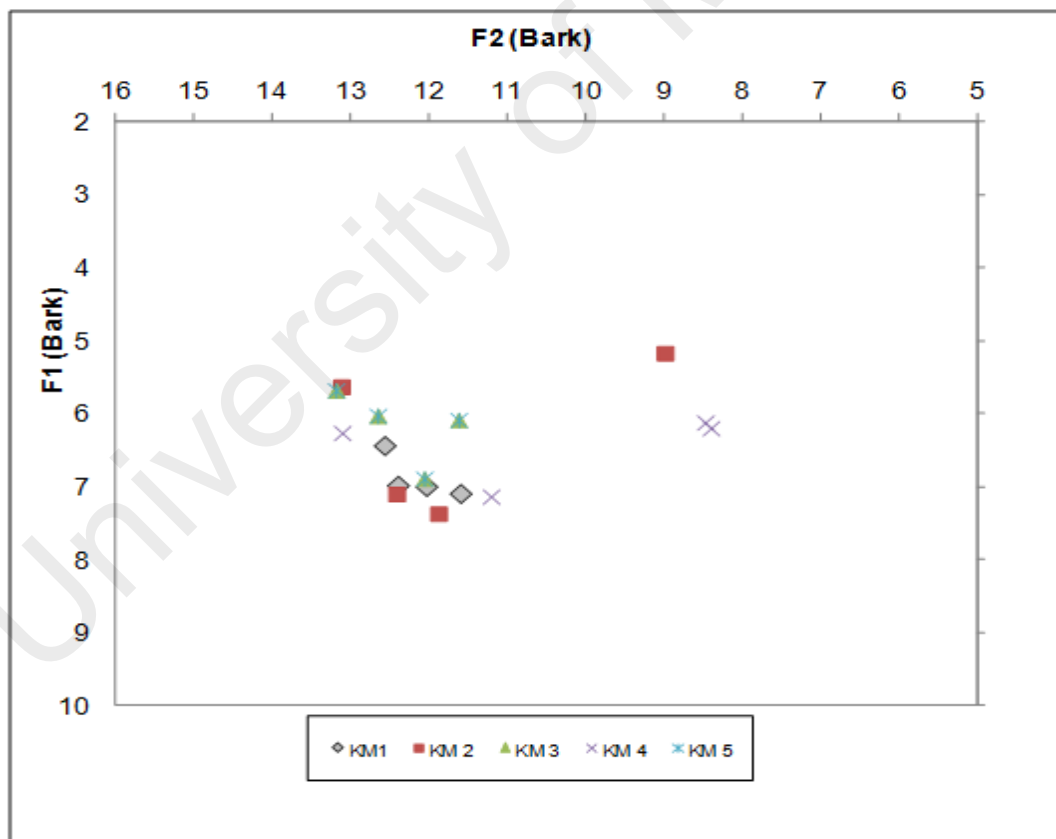
Figure 4.2: Scatter plot for /a/ for Kedah Malay monophthongs

4.2.2 Kedah Malay /o/

Figure 4.3 shows the distribution of vowels /o/ and it is loosely overlapped. It differs with both Yunisrina (2013) and Teoh (1994). Distribution of Yunisrina's (2013) /o/ is tighter and close to each other but in this study /o/ is scattered and it also displays inconsistencies for each participant. /o/ in this study scattered from half-close, central position to half-close back position. /o/ in Yunisrina (2013) on the other hand is centralised at close, near back position. It also differs with /o/ in Teoh (1994) since /o/ in Teoh (1994) is located at half-close, back position which is quite similar with /o/ in Yunisrina (2013).
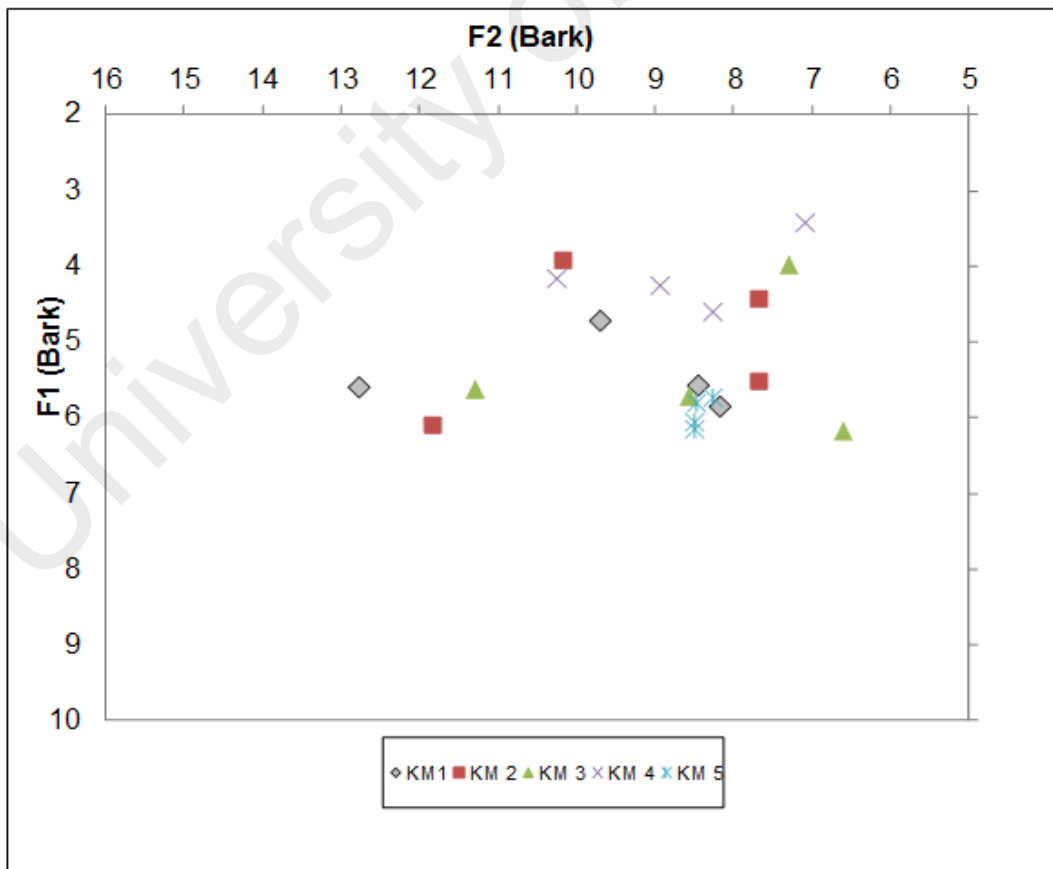
Figure 4.3: Scatter plot for vowel /ʊ/ for Kedah Malay monophthongs

4.2.3   Kedah Malay /i/

Figure 4.4 shows the scatter plot for vowel /i/. It displays low overlapping and deviations for few instances but it is still quite close to each other for majority of the instances. /i/ in this study is distributed at close, front position. The distribution is generally similar with Yunisrina (2013) and Teoh (1994) as both are also located at close, front position. There are few inconsistencies for KM2, KM3 and KM4 but the rest of the instances are still within the same area of distribution.
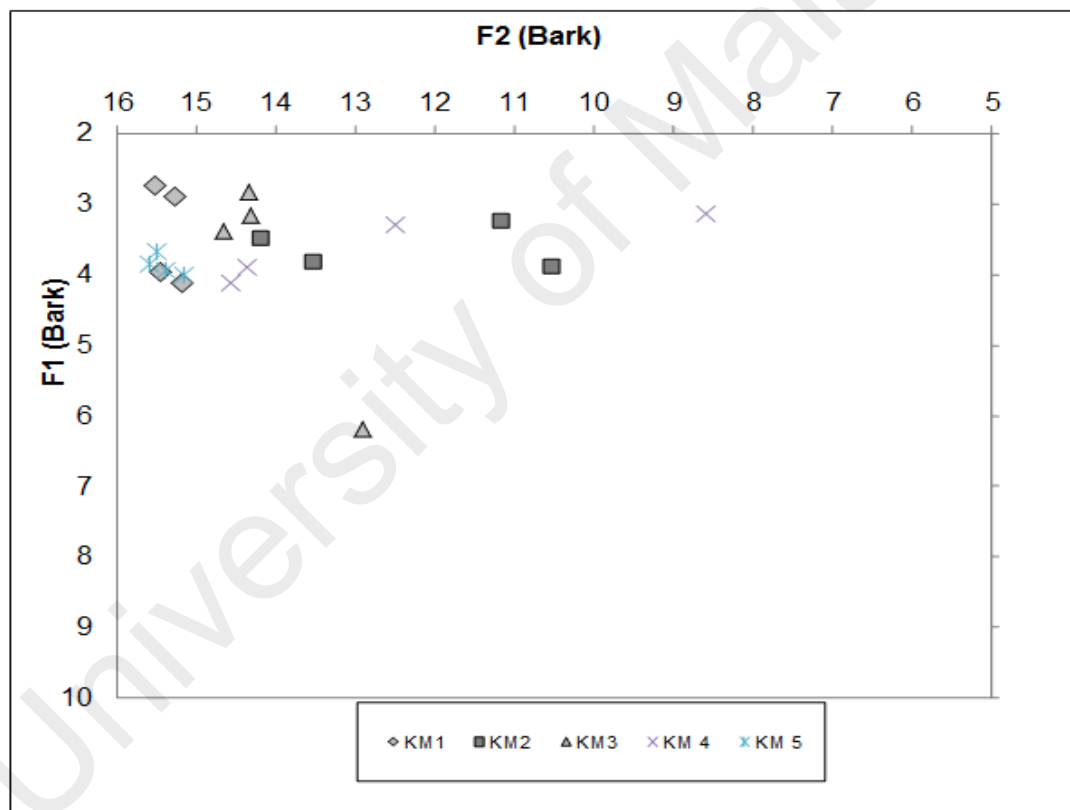

Figure 4.4: Scatter plot for /i/ for Kedah Malay monophthongs

4.2.4   Kedah Malay /e/

Figure 4.5 shows the distribution of vowel /e/ which has the most overlapped distribution compared to the other 7 vowels. /e/ in this study is distributed at near close,

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front position and it is also in tandem with finding from Yunisrina (2013). On top of that, it is similar with Teoh (1994) in terms of frontedness, but in terms of openness, it slightly differs as Teoh's (1994) /e/ is located at half-close, front position. One notable deviation is for KM4 in one instance, the distribution is at close, back position which should not be the case for vowel /e/.
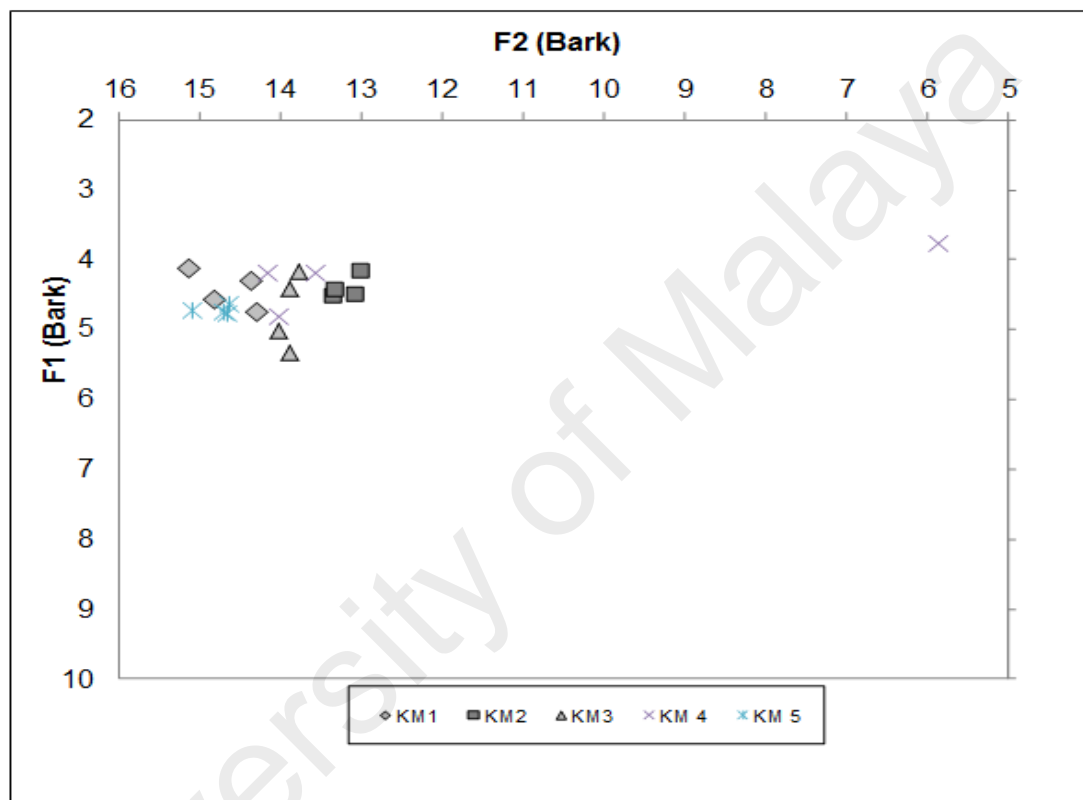

Figure 4.5: Scatter plot for /e/ for Kedah Malay monophthongs

4.2.5   Kedah Malay /ə/

Figure 4.6 displays distribution of vowel /ə/ and it is closely overlapped at half-close, slightly away from central. It is similar with Yunisrina (2013) but there are few cases of deviations particularly for KM2 and KM4 although the rest of their instances are close to half-close, near central position. Those deviations could be attributed in error in measurements or differences in pronunciation for certain target words. /ə/ in

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Teoh (1994) is similar with /ə/ in terms of openness, but slightly differ in terms of backness as /ə/ is positioned at half-close, central location.
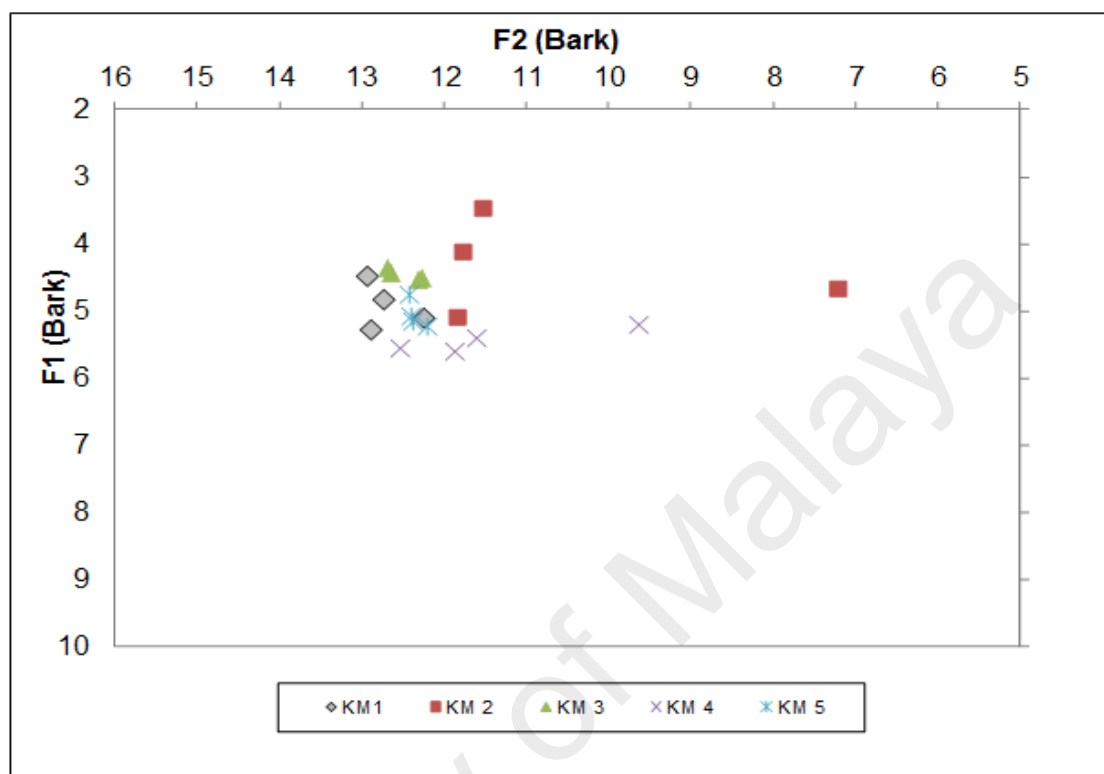

Figure 4.6: Scatter plot for l /ə/ for Kedah Malay monophthongs

4.2.6 Kedah Malay /ɛ/

Figure 4.7 displays the vowel distribution of /ɛ/. /ɛ/ in this study is scattered at half-close, front position and moving towards half-close, near central position. There are only four instances in this plot as measurement of KM4 is removed due to huge deviation. /ɛ/ for KM4 is moving towards close, central position which should not be the case for /ɛ/. Distributions of /ɛ/ in this study are similar to Yunisrina but /ɛ/ in her study is more overlapped to each other. In fact, it is also similar with Teoh (1994) in terms of frontness, but slightly differs as /ɛ/ in Teoh (1994) is located at near open, front position.
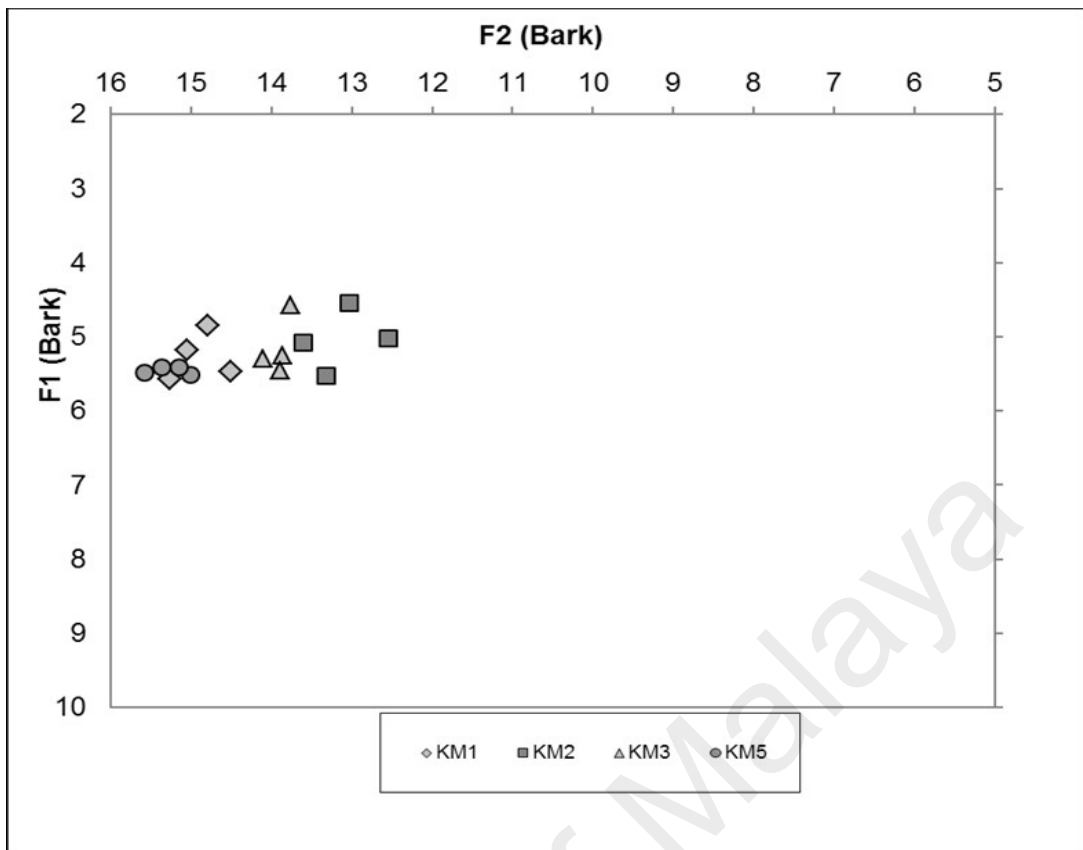
Figure 4.7: Scatter plot for vowel /ɛ/ for Kedah Malay monophthongs

4.3 Findings on Standard Malay monophthongs

The values of averages for F1 and F2, values of F1 and F2 in Bark for Standard Malay monophthongs are presented in Table 4.2.

Table 4.2: F1 and F2 averages for Standard Malay monophthongs

Tokens	Ave F1 (Hz)	SD	Ave F2 (Hz)	SD	Ave F1 (Bark)	Ave F2 (Bark)
i	419	5.89	2396	62.87	4.02	14.24
e	538	37.94	2217	85.89	5.06	13.75
ə	501	42.55	1501	99.80	4.74	11.19
a	656	21.74	1690	108.16	6.04	11.99
o	575	22.92	857	34.86	5.37	7.54
u	425	4.01	881	91.80	4.07	7.70

Ave = Average
ms = milliseconds
SD= Standard Deviation

Figure 4.8 shows the location of the monophthongs of Standard Malay that are obtained in this research. There are few observations that should be highlighted. Location of /u/ in this study is similar with Teoh's Standard Malay (1994) as it is located at close, back position. The same analysis is applicable to /o/ as both /o/ in Teoh (1994), and in this study, are located at near half-close, central position. /a/ in this study is quite similar with Teoh (1994) except that it is positioned at open, near central position instead at central in Teoh (1994). /e/ in the other hand is similar with Teoh (1994) in terms of openness but slightly differs in frontedness. /e/ in this study is located at half-close, near front position. The vowel /ə/ is aligned with Teoh (1994) as it is located at half-close, central position. It is also similar with /i/ as both /i/ by Teoh (1994), and in this study, it is located at a close, front position.
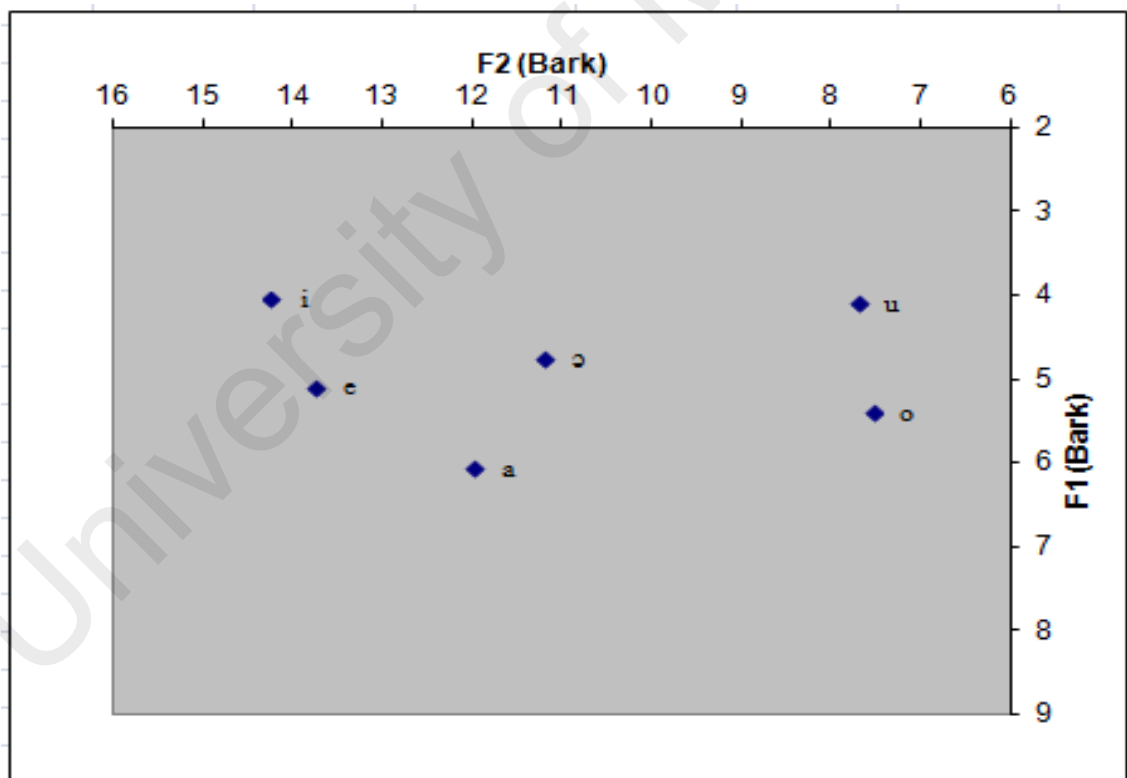
Figure 4.8: Vowel plot of Standard Malay monophthongs

4.4 Comparison between Kedah Malay and Standard Malay monophthongs

Based on the Figure 4.9 and 4.10, there are similarities between vowels in Kedah Malay and Standard Malay in terms of position. This could be attributed to the way the speakers read the sentences. Although they have been asked to speak naturally, they might tend to read the sentences based on the way it was written. The vowel /i/ for both KM and SM are located at close, front position, which is also similar with Teoh (1994). Similar analysis is applicable for /u/ as it is located at close, back position which is also in accordance with Teoh (1994). The locations of /o/ and /ɔ/ are close to each other, and this is quite similar with Teoh (1994) although /o/ in his work is more back compared to KM and SM in this study. The vowel /ə/ for both varieties is located at a half-close, central position and this is expected as /ə/ is a central vowel. The vowel /e/ on the other hand is near front for both KM and SM but at half-close, front position for Teoh (1994).
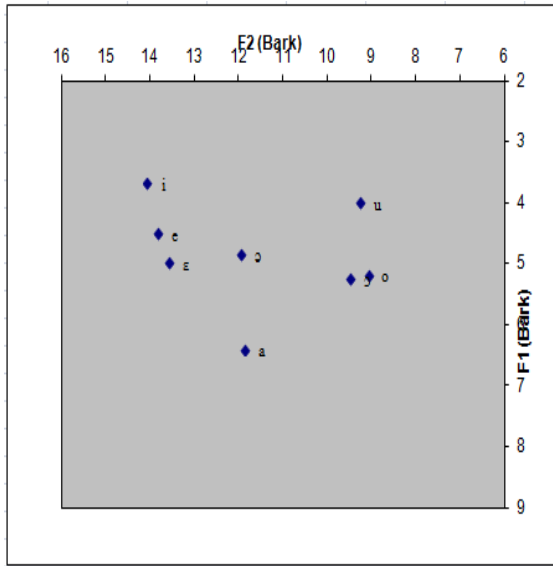
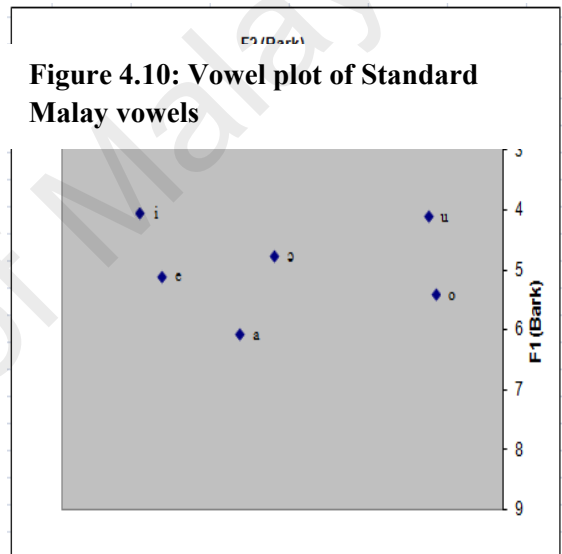**Figure 4.9: Vowel plot of Kedah Malay vowels**

Figure 4.10: Vowel plot of Standard Malay vowels

4.4.1 Comparison between Kedah Malay /ɛ/ and Standard Malay /e/

One of the differences between Kedah Malay and Standard Malay is the use of /ɛ/ and /e/. Figure 4.11 and 4.12 show the scatter plots of Kedah Malay /ɛ/ and Standard Malay /e/. In Kedah Malay participants are using /ɛ/ and the distributions of the vowels are located at front, half-close position but spreading to the central area for few participants. Measurement of KM4 has been removed as it deviates too far from the rest of the participants. For Standard Malay, participants were using /e/. The distributions of /e/ are clustered closer to each other among participants in Standard Malay compared to Kedah Malay.
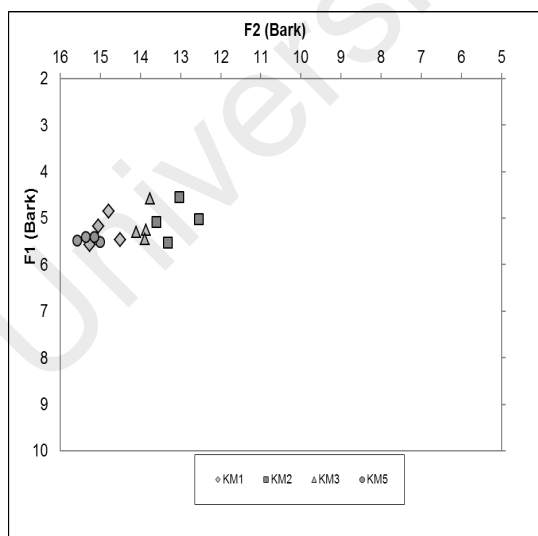

Figure 4.11: Scatter plot of Kedah Malay / ɛ /
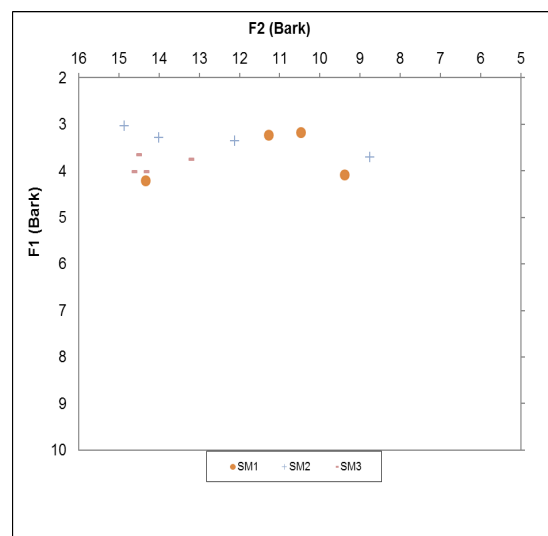
Figure 4.12: Scatter plot of Standard Malay / e /

4.4.2 Comparison between Kedah Malay /ɔ / and Standard Malay /o/

Figures 4.13 and 4.14 show the scatter plots for Kedah Malay /ɔ/ and Standard Malay /o/. This is another difference found between the two varieties. The distribution of Kedah Malay /ɔ/ are scattered from near central to near back and mid area. However, for Standard Malay /o/ the distribution are more scattered compared to Kedah Malay participants. The distribution of /o/ is in a central to back and close area.

Figure 4.13 Scatter plot of Kedah Malay /ɔ/

Figure 4.14 Scatter plot of Standard Malay /o/

4.5 Summary

Eight monophthong vowels of Kedah Malay were produced by participants in this research. Those vowels are [a], [e], [i], [o], [u], [ɔ], [ɛ] and [ə]. Similar set of vowels were also produced by partic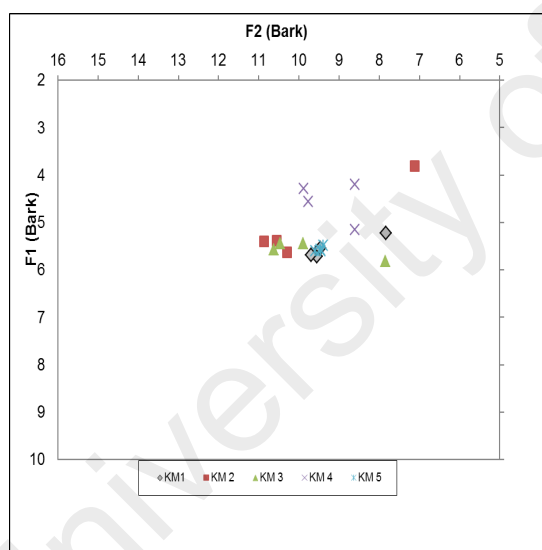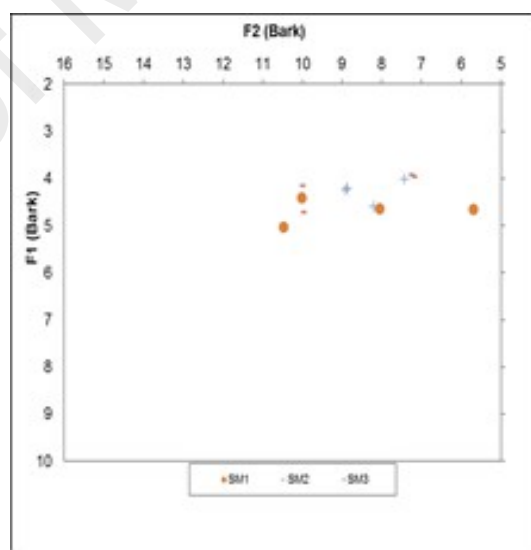ipants of Standard Malay. This study affirmed to the work of Asmah (1993). Most importantly it helps to add to the body of knowledge for Kedah Malay. For Kedah Malay the vowels in this research are similar with those of Asmah (1993), and they are [a], [e], [i], [o], [u], [ɔ], [ɛ] and [ə]. There are few similarities between the findings of Kedah Malay and work of Yunisrina (2013). In terms of the locations of [i] and [e] on the vowel plot both are close to each other and located at front, close position, although [i] and [e] in Yunisrina (2013) are nearer to each other in terms of being in a close position. This is also similar with Teoh (1994) that suggested the location of [i] and [e] on close, front position. The same case applied to the position of [u] and [o] in this research. Both are located at a close, back position, and this is also parallel with [u] and [o] in Yunisrina's (2013) as well as Teoh (1994). The main difference in this finding with Yunisrina (2013) is the location of [ə]. Both Yunisrina (2013) and Teoh (1994) positioned [ə] at half-close, central position but [ə] in this research is located at open, front position. It shows huge discrepancy as [ə] is a central vowel (Yunus, 1980) and supposedly located at half-close, central position.

CHAPTER 5: CONCLUSION

5.1 Introduction

This chapter recapitulates the main findings obtained from this study. It will be explained in relation with the research questions in terms of the acoustic features of the monophthongs of Kedah Malay and similarities and differences of Kedah Malay and Standard Malay monophthongs based on acoustic properties and qualities.

5.2 Summary of findings

The findings are separated and explained based on the research questions that are mentioned earlier in Chapter 1.

5.2.1 Research question 1

What are the features of the monophthongs of Kedah Malay based on their formant values?

Based on the analysis, it was found that all eight vowels that are suggested by Asmah (1993) exist in Kedah Malay and they are /i e a u o ə ɛ ɔ/. The vowel /i/ is located at close, front position and /ɛ/ is located at half-close, near front position. Both vowels do not differ much from /i/ and /e/ proposed by Teoh (1994). The same situation applied to both /u/ and /o/ as they are parallel with locations proposed by Teoh (1994). The vowel /u/ is positioned at close, back position and /o/ is located at half-close, back position. The vowel /a/ in this research is positioned at open, near front. This is again almost parallel with the location of /a/ in vowel inventory by Teoh (1994) although his /a/ is more fronted. However, for /ə/ it differs greatly from both Teoh (1994) as well as Yunisrina (2013) as it is very open, and in front position. There are possibilities that the participants do not differentiate much between /ə/ and /a/ in Kedah Malay as both vowels are close to each other. There are altogether three front vowels in Kedah Malay, /i e a/ and two back vowels / u o/. /e/ is located at central.

5.2.2 Research question 2

What are the similarities and differences of Kedah Malay and Standard Malay monophthongs based on their acoustic properties?

The overall quality for the six shared vowels between Kedah Malay and Standard Malay are similar as there are no differences between the two. However, this could be attributed to the way speakers read the sentences. They were asked to read the sentences in Kedah Malay but the speakers might be reading it based on the way it is spelled. Two notable differences between the two varieties are Kedah Malay uses / ɛ / and / ɔ / while Standard Malay uses /e/ and /o/.

5.3 Limitations

This research was based on two groups of participants, five participants of Kedah Malay and three participants of Standard Malay. There are altogether eight participants and it is still considered small in terms of size. On top of that, all participants in this research are female, which do not represent the other gender and the selection of participants is based on questionnaires distributed to them before the selection. The age of participants in this study is between 45 -60 years old and findings might not reflect speakers from different ages. Other than that, this research is only focused on monophthongs of Kedah Malay and monophthongs of Standard Malay are used as comparator. Therefore, the results could not be generalized on diphthongs since diphthongs require different method and approach. In terms of data collection, the participants are given set of sentences to read and findings deducted from this method might not represent the way they use spontaneous speech.

5.4 Future directions

Findings from this research suggest that there are no significant differences between two groups of speakers. Research should also be done with younger participants or with the inclusion of other gender as well. In addition to that, larger sample of participants will also help to strengthen the results as well as to disprove or confirm the findings in this research. Data elicitation methods could also include the use of spontaneous speech as participants would pronounce the words in different manner compared to when they are giving set of sentences to read.

5.5 Conclusion

The findings that are obtained from this study helps to add to the body of knowledge of Kedah Malay as previous research that was done on solely Kedah Malay are outdated. Therefore, these findings will help to add new information on Kedah Malay. Other than that, these findings will also suggest for a more comprehensive research on Kedah Malay particularly on other aspects as well such as diphthongs, sonorants or fricatives as it will assist others to better understand phonetics properties of Kedah Malay as a whole.

References

Abdul Karim Ismail (1971). *Dialek Baling: sifat-sifat umum dan kumpulan teks.* Unpublished academic exercise for the BA degree in Malay Studies, Department of Malay Studies, University of Malaya, Kuala Lumpur.

Abdullah Hassan (1966). Perbandingan tatabunyi antara dialek Kedah dengan dialek Perak. Unpublished academic exercise for the BA degree in Malay Studies, Department of Malay Studies, University of Malaya, Kuala Lumpur.

Asmah Haji Omar. (1971). Standard Language and the standardization of Malay. *Anthropological Linguistics,13*(2), 75-89. Retrieved from http://www.jstor.org/stable/30029277

Asmah Haji Omar. (1977). *The phonological diversity of the Malay dialects* (No. 2). Bahagian Pembinaan dan Pengembangan Bahasa. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Asmah Haji Omar. (1982). *Language and society in Malaysia*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Asmah Haji Omar (1987). *Malay in its sociocultural context*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Asmah Haji Omar. (2008). Dialek Kedah. *Susur galur Bahasa Melayu* (2nd ed.). Kuala Lumpur: Dewan Bahasa dan Pustaka.

Boersma, Paul & Weenink, David (2016). Praat: doing phonetics by computer [Computer program]. Version 6.0.28, retrieved 23 March 2016 from http://www.praat.org/

Collins, J. T. (1996). *Khazanah Dialek Melayu*. Bangi: Penerbit Universiti Kebangsaan Malaysia.

Crothers, J. (1978). Typology and universal of vowel systems, In J. H. Grcenberg, C. A. Ferguson & E. A. Moravcsik, (Eds.), *Universals of human language* Vol. 2: Phonology (pp. 93-152). Stanford: California Stanford University Press.

Clynes, A., & Deterding, D. (2011). Standard Malay (Brunei). *Journal of the International Phonetic Association*, *41*(2), 259-268.

Deterding, D. (1997). The formants of monophthong vowels in Standard Southern British English pronunciation. *Journal of the International Phonetic Association, 27*(1-2), 47–55.

Deterding, D. (2000). Measurements of the /eɪ/ and /əʊ/ vowels of young English speakers in Singapore. In A. Brown, D. Deterding & E. L. Low (Eds.), *The English language in Singapore: Research on pronunciation* (pp. 93-99). Singapore: Singapore Association for Applied Linguistics.

Deterding, D. (2003). An instrumental study of the monophthongs vowels of Singapore English. *English World -Wide, 24*(1), 1-16.

Deterding, D. (2005). Emergent patterns in the vowels of Singapore English. *English World-Wide, 26*(2), 179-197.

Deterding, D. (2006). The North Wind versus a Wolf: short texts for the description and measurement of English pronunciation. *Journal of the International Phonetic Association, 36*(2), 187-196.

Deterding, D. (2007). The vowels of the different ethnic groups in Singapore. In D. Prescott (Ed.), *English in Southeast Asia: Varieties, literacies and literatures* (pp. 2-29). Cambridge: Cambridge Scholars.

Hayward, K. (2000). *Experimental phonetics* (2nd ed.). Harlow: Longman

Idris Aman, Mustaffa Rosniah, Zaharani Ahmad, Jamilah Mustafa, & Mohamad Fadzeli Jaafar. (2011). In Idris Aman (Ed.), Aksen standard bahasa kebangsaan: Realiti, Identiti dan Integrasi. *Aksen bahasa kebangsaan: Realiti, identiti dan integrase* (pp.72-82). Bangi: Penerbit Universiti Kebangsaan Malaysia

Indirawati Zahid. & Mardian Shah Omar. (2012). *Fonetik dan fonologi* (2nd ed.). Selangor: PTS Akademia.

Kent, R., & Read, C. (2002). *The acoustic analysis of speech* (2nd ed.). New York: Thomson Learning.

Ladefoged, P. (2001). *A course in phonetics* (4th ed.). Fort Worth: Harcourt College.

Ladefoged, P. (2003). *Phonetic data analysis: An introduction to fieldwork and instrumental techniques*. City: New York: Wiley-Blackwell.

Osman Omar. (1987). *Dialek Kedah yang dituturkan di Sungai Petani: satu kajian perbandingan dari segi fonologi, morfologi dan leksikal mengikut konteks penggunaan.* Academic Exercise. University of Malaya, Kuala Lumpur, Malaysia.

Pillai, S. & Yunisrina Qismullah Yusuf. (2012). An instrumental analysis of Acehnese oral vowels. *Language and Linguistics*, *13*(6), 1029.

Pillai, S., Zuraidah Mohd Don., Knowles, G. & Tang, J. (2010). Malaysian English: an instrumental analysis of vowel contrasts. *World Englishes*, *29*(2), 159-172.

Salbrina Sharbawi. (2006). The vowels of Brunei English: An acoustic investigation. *English World-Wide*, *27*(3), 247-264.

Teoh, B. (1994). *The sound system of Malay revisited*. Kuala Lumpur: Dewan Bahasa dan Pustaka

Ting, H.N., Zourmand, A., Chia, S.Y, Yong, B.F. and Abdul Hamid, B. (2012). Formant frequencies of Malay vowels produced by Malay children aged between 7 and 12 years. *Journal of Voice*, *26*(5), pp.e1-6.

Yunisrina Qismullah Yusuf. (2013). *A comparative study of vowels in the Acehnese language spoken in Kedah, Malaysia and Aceh, Indonesia*. Unpublished Ph.D thesis. University of Malaya, Kuala Lumpur, Malaysia.

Yunus Maris. (1980). *The Malay sound system*. Kuala Lumpur, Kuala Lumpur: Fajar Bakti.

Zanten, E. & Heuven, V. J. (1984). The Indonesian vowels as pronounced and perceived by Toba Batak, Sundanese and Javanese speakers. *Journal of the Humanities and Social Sciences of Southeast Asia*, *140*(4), 497-521.

Zwicker, E., & Terhardt, E. (1980). Analytical expression for critical-band rate and critical bandwidth as a function of frequency. *Journal of the Acoustical Society of America*, *68*(5), 1523-1525.

APPENDIX A - QUESTIONNAIRE

Nama	Name
Umur	Age
Pekerjaan	Occupation

Tempoh bermastautin	How long you have been staying here?
Tempat kelahiran	Place of birth
Status perkahwinan	Are you married?
Tempat kelahiran pasangan	If yes, where is your spouse hometown?
Tempoh bermastautin pasangan	How long your spouse has been staying here?
Pekerjaan pasangan	What is your spouse's occupation?
Taraf pendidikan	What is your level of education?

APPENDIX B - AVERAGE VALUE FOR EACH VOWEL FOR KEDAH MALAY PARTICIPANTS

Participants	Tokens	F1 (Hz)	F2 (Hz)	F1 (Bark)	F2 (Bark)
KM 1	i	354.58	2878.97	3.43	15.36
	e	465.93	2560.80	4.44	14.66
	ɛ	562.21	2671.79	5.27	14.91
	ə	521.79	1880.36	4.92	12.70
	a	764.82	1730.38	6.88	12.15
	o	583.92	1260.45	5.45	10.03
	ɔ	594.52	1106.85	5.54	9.17

	u	406.85	1329.76	3.91	10.39
KM 2	i	374.29	1835.89	3.61	12.55
	e	458.82	2034.05	4.37	13.21
	ɛ	536.09	2012.02	5.05	13.14
	ə	456.82	1413.49	4.36	10.80
	a	695.87	1633.83	6.35	11.77
	o	533.38	1169.25	5.02	9.53
	ɔ	538.78	1224.68	5.07	9.84
	u	432.69	1055.49	4.14	8.86
KM 3	i	409.51	2338.23	3.93	14.10
	e	500.44	2261.60	4.74	13.89
	ɛ	547.96	2267.99	5.15	13.91
	ə	468.21	1817.68	4.46	12.48
	a	673.85	1797.26	6.18	12.41
	o	577.09	1018.64	5.39	8.63
	ɔ	598.27	1214.35	5.57	9.78
	u	391.63	1105.99	3.77	9.16
KM 4	i	373.83	1950.32	3.61	12.94
	e	444.15	1862.19	4.24	12.64
	ɛ	414.68	1378.11	3.98	10.63
	ə	583.05	1566.71	5.44	11.49
	a	706.76	1369.00	6.44	10.58
	o	430.28	1031.28	4.12	8.71
	ɔ	478.66	1119.19	4.55	9.24
	u	391.34	1042.39	3.77	8.78
KM 5	i	401.39	2902.23	3.86	15.41
	e	498.38	2607.42	4.72	14.77
	ɛ	584.33	2840.52	5.45	15.28
	ə	536.95	1782.34	5.05	12.35
	a	673.85	1797.26	6.18	12.41
	o	642.86	988.60	5.93	8.44
	ɔ	597.23	1159.36	5.56	9.47
	u	460.92	1094.28	4.39	9.09

APPENDIX C – AVERAGE VALUE FOR EACH VOWEL FOR STANDARD MALAY PARTICIPANTS

Participants	Tokens	F1 (Hz)	F2 (Hz)	F1 (Bark)	F2 (Bark)
SM 1	i	417.97	2326.13	4.01	14.06
	e	538.14	2310.30	5.06	14.02
	ɛ	507.47	2281.25	4.80	13.94
	ə	492.75	1616.60	4.67	11.70
	a	663.86	1694.70	6.10	12.02
	o	582.41	874.36	5.44	7.67
	ɔ	552.02	937.91	5.18	8.11
	u	427.08	914.20	4.09	7.95
SM 2	i	415.33	2418.59	3.99	14.31
	e	577.05	2140.85	5.39	13.54
	ɛ	541.43	2328.08	5.09	14.07
	ə	463.53	1443.74	4.42	10.94
	a	632.20	1581.04	5.85	11.55
	o	594.10	880.06	5.54	7.71
	ɔ	523.83	1064.97	4.94	8.92

	u	420.66	952.05	4.03	8.20
SM 3	i	426.58	2446.14	4.09	14.38
	e	501.18	2201.21	4.75	13.72
	ɛ	459.36	2529.70	4.38	14.58
	ə	547.35	1443.74	5.14	10.94
	a	673.85	1797.26	6.18	12.41
	o	549.86	817.03	5.16	7.27
	ɔ	569.53	937.48	5.33	8.10
	u	428.04	777.54	4.10	6.98