AN ACOUSTIC ANALYSIS OF /ɛ/ and /ɔ/ IN THE KELANTAN DIALECT

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ABSTRACT

This study aims to describe the vowels /ɛ/ and /ɔ/ of Kelantan dialect (KD) with acoustic analysis between two groups of speakers. The first group is born, raised, and live in Kelantan (KDPP) while the second group is born and raised in Kelantan but currently stay in Klang Valley (KDKL). This research uses an instrumental analysis approach where an interview with the speakers is conducted in order to gather the data. The collected data are measured and analysed using Praat developed by Boersma and Weenink (2017). This research is to provide a quantitative analysis on two of the very significant vowels in Kelantan dialect, /ɛ/ and /ɔ/. This study also intends to compare the /ɛ/ and /ɔ/ vowels of KDPP and KDKL speakers, to see to what extent does the difference of /ɛ/ and /ɔ/ vowel realisation between KDPP and KDKL speakers. It is believed that it could provide a further understanding on KD and how the vowel quality differs between the two groups. The findings reveal that the vowel /ɛ/ and /ɔ/ between KDPP and KDKL speakers both male and female are realised differently and none of them are conflated completely as one vowel. The production of /ɛ/ and /ɔ/ vowels between KDPP and KDKL in this study is not entirely similar due to several reasons. vowel /ɛ/ and /ɔ/ in this study both for KDPP and KDKL are not realised based on sound patterns of the KD vowels.

Keywords: Formant Frequency Model, phonemes, Kelantan Dialect, acoustic analysis.

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ANALISIS AKUSTIK /Ɛ/ AND /Ɔ/ DALAM DIALEK KELANTAN

ABSTRAK

Matlamat utama pembelajaran ini adalah untuk menghuraikan huruf vokal /ɛ/ and /ɔ/ di dalam dialek Kelantan menggunakan analisis akustik di antara dua jenis kumpulan penutur jati. Kumpulan pertama ialah mereka yang lahir dan membesar di Kelantan (KDPP) manakala kumpulan kedua ialah mereka yang lahir dan membesar di Kelantan tetapi telah menetap di Lembah Klang (KDKL). Kajian ini menggunakan data pendekatan analisis instrumen dimana telah dilakukan melalui temuduga dengan kedua-dua kumpulan penutur dalam mengumpul data. Pengumpulan data bagi mengukur dan menganalisis menggunakan Praat yang diperkenalkan oleh Boersma and Weenink (2017). Kajian ini juga bertujuan untuk membezakan vokal /ɛ/ and /ɔ/ dalam dialek Kelantan untuk melihat kadar perbezaan vokal /ɛ/ and /ɔ/ diantara penutur KDPP dan KDKL. Ini dipercayai bahawa boleh membantu pemahaman yang lebih untuk dialek Kelantan dan bagaimana kualiti huruf vokal berbeza diantara dua jenis kumpulan penutur dalam kajian ini. Hasil kajian menunjukkan bahawa vokal / ɛ / dan / ɔ / antara penutur KDPP dan KDKL lelaki dan perempuan disedari secara berbeza dan setiap vokal ini tidak direalisasikan sebagai satu vokal tunggal. Vokal /ɛ/ dan /ɔ/ dalam kajian ini untuk KDPP dan KDKL tidak direalisasikan berdasarkan pola bunyi vokal KD.

Kata kunci: Formant Frequency Model, Fonem, Dialek Kelantan, analisa akustik.

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LIST OF SYMBOLS AND ABBREVIATIONS

KD	:	Kelantan Dialect
SM	:	Standard Malay
KDPP	:	Kelantan Dialect Pasir Puteh
KDKL	:	Kelantan Dialect Kuala Lumpur

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Dialect is a variation of a particular language spoken by a group of speakers in a specific language community (Abdul Hamid Mahmood, 2006). It has specific elements and is being spoken in specific regions with different ways from standard language, language that is spoken by and understood by a community (Merriam-Webster's Collegiate Dictionary, 2020) in terms of pronunciation, grammar and some usages of certain words. However, all these differences do not contribute larger differences to the extent that dialect can be considered as another different language.

According to Abdul Hamid Mahmood (2006), there are numbers of factors that cause the emergence of dialect such as the components of geography, politics, colonialism, trading and time. All these factors will influence the dialect that are being spoken by a specific community in a specific place. In addition, political factor has divided Malaysia into smaller political units and that is called as states known as Perlis, Kedah, Pulau Pinang, Selangor, Negeri Sembilan, Melaka, Johor, Pahang, Terengganu and Kelantan. From the names of those states, the dialect in Peninsular Malaysia gets its name known as Perlis Dialect, Terengganu Dialect and Kelantan dialect and so on and so forth. Dialects that are based on such places are called local dialects. According to Adrian Clynes and David Deterding (2011), the most divergent Malay dialects in terms of phonetics and phonology can be found in most dialects in Peninsular Malaysia.

All the local dialects in Malaysia are the results of the variations from Standard Malay (SM). In other words, the structures of dialects are derived from Standard Malay itself. Kelantan dialect (KD) is one of the Malay dialects spoken in

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Peninsular Malaysia and is the main affair in this study. Kelantan is located in the east coast of Peninsular Malaysia. Terengganu, Pahang, Perak and Thailand are the borders of Kelantan. Kelantan has been divided into 10 different districts known as Kota Bharu, Tumpat, Pasir Mas, Tanah Merah, Machang, Pasir Puteh, Bachok, Jeli, Kuala Krai and Gua Musang. Kelantan is not that huge with about 5760 square kilometres and has a population of 1.5 million people (Abdul Hamid Mahmood, 2006). KD is very much influenced by Patani Malay dialect in southern Thailand.

Kelantan people use the Kelantan dialect extensively, not only in private or informal contexts, but also in public spaces such as mosques, schools, institutions of government and legislative bodies. The dialect practise shows the identity of the people which shows their uniqueness (Azrizan Abu Bakar, Karim Harun, Habibu Morsili & Zanariah Mat Isa, 2017).

> "...Kelantan society has its own inimitable uniqueness of cultural and language versus other states.." (Winzeler, 1985)

Kelantan, with a population of about 1.5 million, is having a unique dialect as well as famous culture, diversity of tradition and works of art. Regardless of many races in Kelantan, they use KD to converse with each other as a process of creating a sense of well-being as well as maintaining their own fellows of Kelantan (Zuraidah, 2003). The use of this dialect displays the identity of the localities which reveals their uniqueness.

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1.2 PROBLEM STATEMENT

Kelantanese fellows speak Kelantan dialect extensively, not just in private or informally, but also in public venues like as mosques, schools, government organisations, and statutory bodies. The dialect practise demonstrates the people's individuality by displaying their identity. First and foremost, there are 36 phonemes in Malay. It includes 27 consonants, 6 vowels and three diphthongs (Tien-Ping Tan & Bali Ranaivo-Malancon, 2009). SM has several vowels which are /i/, /e/, /a/, /u/, /o/ and /ə/ which is similar to KD. However, according to Asmah Haji Omar (2015), there are two additional vowels in KD, /ɛ/ and /ɔ/. They are not used in writing, but they are used separately in speaking. For example, vowel /ɛ/ and /ɔ/, /ɔ/ and /ɛ/ in KD are commonly opposed to [e] and [o], [o] and [e] in SM (Haji Abdul Jalil Haji Anuar et al, 2016). For example, word such as '[pɛkɔŋ]' – pekong in KD is called, (lempar) in SM.

In addition, KD has its own features of pronunciation, vocabulary and syntax, which are distinct from SM which is unintelligible to people who speak other than KD (Zuraidah Mohd. Don, 2003). In other words, KD is not easily understood by people who do not converse using the dialect or people who are not familiar with the dialect. On the other hand, inter-comprehension between KD and SM could potentially create problems to the speakers of these two varieties from understanding each other. For example, the word /ɑŋin/ is a homograph that carries different meaning in both SM and KD. In SM, /ɑŋin/ is referring to wind whereas in KD refers to an adjective of someone being mad.

Hence, this study looks at the vowels /ɛ/ and /ɔ/ in KD and sees to what extent the vowel quality differs between the two groups of KD speakers and the phonological context that affect those two KD vowels, /ɛ/ and /ɔ/. These findings are further discussed in chapter 2. Acoustic analysis is used in this study because it will investigate

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the acoustic aspects of speech sounds, especially the fundamental frequency (Yavas, 2011). According to Liberman et. al (1967), speech is not a simple alphabet, but rather a complex code contains "speech sounds". These speech sounds represent a very significant restructuring of the phonemic message. Hence, more research is required to examine acoustic properties in phonetic study. Thus, this study will add more findings and provide a clear understanding of KD by studying the vowel system of KD. On top of that, this finding will also generate results from two different groups which are KDPP and KDKL for both male and female speakers.

1.3 SIGNIFICANCE OF THE STUDY

The dialect that is being investigated against SM in this study is the KD. There are many past studies that have been done by the researchers that are related to dialect such as Kelantan, Perak, Kedah and others. Among the studies conducted that are related to dialect include a variety of aspects such as the comparison between dialects, comparison between dialect and SM and comparison between dialect and subdialects. Not to mention, the study of dialects from the angle of phonetics, morphology, syntax and semantics. However, this study will focus on the vowels /ɛ/ and /ɔ/ in KD and how they will show dissimilar results when they are studied using different gender.

Most people are unaware that the number of vowels in KD and SM are disparate. Asmah Haji Omar (2015) states that KD has two additional vowels in its vowel systems which are /ɛ/ and /ɔ/. As this study will focus on these two vowels acoustically, this paper will offer an exposure to the two vowels of KD, /ɛ/ and /ɔ/. It will contribute acoustically analysed empirical data on KD vowels based on recorded data from speakers' sentences reading. Acoustic analysis is used because it will seize more details of the vowels than an impressionistic study. On top of that, this study will also provide the pronunciation differences between different age and gender as these

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two characteristics are very important in the study of sounds because it will give an impact to both structure and function of the voice and speech mechanisms (Liu, Russo & Larson, 2010).

This study will not only examine the two vowels in KD, /ɛ/ and /ɔ/ based on the F1 and F2 formant frequencies but it will also be extended to see to what extent the difference of /ɛ/ and /ɔ/ vowel realisation between KDPP and KDKL speakers occur. This present study hopes to contribute to this body of knowledge by investigating different gender of two groups of KD speakers against the speakers of SM. The findings of this study will be compared to SM in order to give a clear picture of how the vowels /ɛ/ and /ɔ/ in KD similar or dissimilar to vowels of SM and to see in how the phonological context affect the production of KD vowels /ɛ/ and /ɔ/. Therefore, this study aims to fill the research gap by not only carrying out an instrumental analysis of vowels /ɛ/ and /ɔ/ in KD but also look at the findings according to different gender between two different groups of KD speakers.

1.4 RESEARCH OBJECTIVES

There are two objectives to be focused on this research, which are;

1. To identify the vowel qualities of /ɛ/ and /ɔ/ produced by KDPP and KDKL speakers.

2. To examine the similarities and differences in the vowel qualities produced by KDPP and KDKL speakers**.**

1.5 RESEARCH QUESTIONS

1. What are the acoustic properties of the Kelantan dialect vowels /ɛ/ and /ɔ/ produced by KDPP and KDKL male and female speakers?

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2. To what extent the difference of /ɛ/ and /ɔ/ vowel realisation between KDPP and KDKL male and female speakers?

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1.6 LIMITATIONS

There are several limitations that will be highlighted in this present study. Firstly, the dialect involved in this study is only KD. Hence, the findings and the data analysis of this study will not embody other Malay dialects in Malaysia. All the 8 KD participants who participated in this study have an equal number of male and female participants and, are born, raised and live in Kelantan.

Since this study is a preliminary study, the number of participants is rather small which is 8 participants aged from 19-25 years old. Thus, the results and findings of this study are unable to represent the whole community. Therefore, the findings of this study could not be generalized as a total depiction of the KD vowels because this study did not include any male speakers or female speakers from other age groups. Secondly, this study only confines to the vowel changes of /ɛ/ and /ɔ/ in KD which means the other vowels and consonants of KD will not be included in this study.

The quality of the recordings might not be excellent because it took place in a room and not in a recording studio or a speech laboratory. However, precautionary steps have been taken to ensure that the accuracy of the recordings has not been significantly affected. The recordings were done to eliminate echoes in a carpeted environment, and the fans were turned off to decrease any ambient noise. To minimize the sound of the wind and high-frequency noise from the ambient atmosphere during the interviews, the recorder is positioned approximately 30cm from the participants' mouth.

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1.7 STRUCTURE OF DISSERTATION

This dissertation is divided into five chapters. The first chapter outlined the objectives of this study and the second chapter is the review of all the related literature. The third chapter described the methodology that is used to obtain and analyze the data in this study. The fourth chapter described the finding and the discussion of this study. Lastly, the fifth chapter in the conclusion where all the findings and discussion will be wrapped up nicely to answer two research questions in this study.

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CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter discusses the different variations and characteristics of vowels in Kelantan Dialect. Different studies done in the past by different researchers are also explained in this chapter. In addition, the Formant Frequency Model is also explained as it is the analytical model adopted in this study.

2.1 DEFINITION OF DIALECT

Virtually, every language in the world has dialects. Dialect diversity, or language variation, reflects the fact that languages evolve over time and that people living in the same region or having the same social identity share language norms; that is, they speak the same dialect. In sociolinguistics, the term dialect refers to the varieties of the same language which differ in many aspects such as vocabulary, pronunciation and grammar. It is also associated with a specific geographical region or social group.

Other than that, a dialect is a specific form of a language, writing, pronunciation, grammar that is spoken in certain areas or certain geographical areas although quite different from the standard language or written language but these differences are not enough to make it one language (Mario A, Pei & Frank Gaynor, 1954). Apart from that, the Malay language and dialects vary depending to geographical and district regions, as they would in many other countries (Nursuriati Jamil, Izzad Ramli & Norizah Ardi, 2019).

According to Asmah Haji Omar (1985), there are two types of dialects which are social dialect and geography dialect. Social dialect is known as the dialect used to describe the differences in speech for certain groups of people. Factors influencing this social dialect include job, education, income, culture background, religion and many

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more (Nurul Ain Ahmad, 2015). While the geography dialect is a term used to identify the geography background of a variety of linguistics features. Asmah (1988) further divided Peninsular Malaysia's Malay dialects into four main groups: 1) the northwestern group, which includes Kedah, Perlis, and Penang; 2) the north-eastern group, which includes Kelantan Malay; 3) the eastern group, which includes Terengganu Malay; and 4) the southern group, which includes Johor, Melaka, Pahang, Selangor, and Perak.

The term dialect comes from the "discourse, language, dialect" of the ancient Greek dialektos, derived from dialegesthai, "to discourse, speak (Pavle Ivic, 2020)."Merriam-Webster (2020) stated that dialect is a regional variety of language distinguished by features of vocabulary, grammar, and pronunciation from other regional varieties and constituting together with them a single language. Einar Haugen (1966: pg922) further explained about dialect:

> The impossibility of stating precisely how many “languages” or “dialects” are spoken in the world is due to the ambiguities of meaning present in these terms, which is shown to stem from the original use of “dialect” to refer to the literary dialects of ancient Greece. In most usages the term “language” is superordinate to “dialect,” but the nature of this relationship may be either linguistic or social, the latter problem falling in the province of sociolinguistics. It is shown how the development of a vernacular, popularly called a dialect, into a language is intimately related to the development of writing and the growth of nationalism. This process is shown to involve the selection, codification, acceptance, and elaboration of a linguistic norm.

According to Holmes (2008), dialect is a subordinate variety of a language and that is what differentiate it from a language. One dialect can be classified as a dialect when a certain language has distinguished components in vocabulary, grammar as well as pronunciation. To put it another way, distinct in terms of grammar, vocabulary and

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pronunciation in a language can be one of the measuring sticks to identify a dialect from the particular language. With this being said, it is the closest definition of the dialect term in this study. According to Zuraidah Mohd Don (2003), dialect is distinguished by variances in pronunciation, word choices and forms, and syntax, with pronunciation and lexis showing the most divergence.

While many people assume that the type of language they speak and the people around them is not a dialect, in fact everyone is speaking a dialect, since dialects are simply variations of the same language (Adger, Wolfram & Christian, 2007). John Mcwhorter (2016: pg 2) mentioned:

> So, what's the difference between a language and a dialect? In popular usage, a language is written in addition to being spoken, while a dialect is just spoken. But in the scientific sense, the world is buzzing with a cacophony of qualitatively equal "dialects," often shading into one another like colors (and often mixing, too), all demonstrating how magnificently complicated human speech can be. If either the terms "language" or "dialect" have any objective use, the best anyone can do is to say that there is no such thing as a "language": Dialects are all there is. If two persons communicating using a dialect and they can comprehend one another while responding using the same dialect, this suggests that they are speaking the same dialect.

2.2 STANDARD MALAY LANGUAGE

Malay is the most widely spoken language of Malaysia. It belongs to the western Austronesian group of languages. In addition, Malay speaking communities are also found in Thailand, Sri Lanka, Australia, Cambodia and South Africa (Collins, 1998). Malay language has become the crucial element back in those days as it is the language used by the Malays and Hindus (Raja Mukhtaruddin, 1982). According to Asmah

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(1977), in Malaysia, the presence of different regional and social dialects is reflected by Malay as the national language.

The Malay language is a branch of the Austronesian language family spoken by more than 33 million people in Malaysia, Indonesia, Southern Thailand, Singapore, and Brunei, according to Encyclopedia Britannica (2018). Among groups with their own local language, Malay was the lingua franca. Malay is also used as a commerce language and a means of government communication. This is owing to the historical influence of Malay dynasties, beginning with Srivijaya in Palembang, Sumatra, in the 7th century, and later the Sultanate of Malacca in the 15th century (Collins, 1996).

In addition, the British-Dutch Treaty separated the Malay realm politically for the first time in history in 1824. The agreement gave the British control of Singapore, the Malay Peninsula, and a third of Borneo (now Malaysia), while the Dutch had control of the rest of Borneo (now Indonesia). Native speakers of Malay represented a minority community in Dutch-controlled regions, with hundreds of native speakers of other languages, including the powerful Javanese language. As a result of influences from Dutch, Javanese, and other languages in the Dutch-controlled province of Java, distinct varieties of Malay arose.

The term Standard Malay (SM) is a term used to indicate a variety of language that is accepted by people of the speech community to be the norm or the prestige dialect that is used in formal communications such as mass media, education and administrations (Teoh Boon Seong, 1994). He points out the similar ideas in the variety of SM as Asmah Haji Omar (1971) and Yunus Maris (1980) where SM is used in formal communication such as in education, administration and mass media. SM is widely spoken in Malaysia, Singapore, Brunei and Indonesia. It is the official language

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of Malaysia and has become the medium of communication in schools and administrations in Malaysia.

Raja Mukhtaruddin (1982: pg 28) quoted from Yunus Maris on pronunciation of SM:-

> '…one which is commonly used between speakers coming from different parts of West Malaysia (previously known as the Federation of Malaya) and Singapore. It is also the pronunciation used in formal speeches, at public functions, at conferences and at gatherings where speakers from different parts of the country meet; and at schools, colleges and other institutions where teachers use Malay as their medium of instruction.'

According to Yunus Maris (1966), every form of pronunciation is considered as language. In other words, he emphasizes on every utterance being spoken by Malays from every corner of the country and that is how he defines pronunciation of SM. However, Asmah Haji Omar (1963) states a different perspective on the status of SM. According to Asmah Haji Omar (1963), SM is a form of language that derives from the variety of Malay dialect across the country. She states:-

> ' The pronunciation of standard Malay as used by Radio and Television Malaysia seems to be a combination of phonological features of the various dialects.'

Thus, according to Raja Mukhtaruddin (1982), Yunus Maris identifies SM according to its pronunciation in formal Malay speeches only while Asmah Haji Omar further identifies SM as being used in formal situations while considering pronunciation, syntax and lexical all together at the same time.

Standard Malay has 26 Latin alphabets consisting of six vowels, nineteen primary consonants, native consonant sounds and eight secondary consonants (Othman

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O. Khalifa, Zakiah Hanim Ahmad, and Teddy Surya Gunawan, 2007). Secondary consonants are the consonants borrowed from other languages in this world. The vowels used in the correct spelling of SM are a, e, i, o and u. However, according to Othman O. Khalifa, Zakiah Hanim Ahmad, and Teddy Surya Gunawan (2007), it is crucial to notice that there are two different types of ‘e’ in Malay words. The two letters "e" have the same shape in writing. In spite of that, the letter "e" has a different pronunciation when the words are spoken aloud. Based on the different pronunciation, the letter ‘e’ is divided into two types which are known as ‘e’ taling and ‘e’ pepet. This resulted in the distinction and disambiguation between the two ‘e’s in SM. For instance, *‘lemak’* (fat) using ‘e’ pepet and *‘cendol’* which uses ‘e’ taling. The ‘e’ pepet actually originated from Sanskrit language and adapted to Malay modern phonological system.

In SM, the features of the vowel influence the distribution of vocal segments in the stem (Teoh Boon Seong, 1994). It is best to note that some vowels may occur in all positions while others may be limited to only certain positions. The vowels [e] and [o] in SM most likely do not occur in the final open syllable except when these vowels undergo the rule of deleting final [r]. In addition, [a] also does not occur in the final open syllable in SM as the result from the derived form, [ə]. According to Teoh Boon Seong (1994), there are three vowels in SM which do not occur phonetically in a final closed syllable which are [i], [u] and [ə]. Besides that, all six vowels in SM can occur in initial open syllable and initial closed syllable.

The status of the glottal stop in Malay phonology has become one of the crucial issues in SM, (Teoh Boon Seong, 1994). Yunus Maris (1980) states that the glottal stop is symbolized in phonetics transcription as [ʔ] while in the official orthography is symbolized as ‘k’. For example, *kakak* for [kakaʔ]. In addition, Teoh Boon Seong

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(1994) further explains that when stems ending with the velar stop are suffixed with vowel initial suffixes /-an/ and /-i/, they will undergo these alterations:-

1. Masak [masaʔ] ‘to cook’
2. Masakan [masaʔkan] ‘dish’
3. Masuk [masoʔ] ‘to enter’
4. Masukkan [masoʔkan] ‘fill it’
5. Masuki [masoʔki] ‘to cause to enter’

According to Othman O. Khalifa, Zakiah Hanim Ahmad, and Teddy Surya Gunawan (2007: pg 7).

> The Standard Malay Language or Bahasa Baku was made upon agreement made by Malaysia, Indonesia and Brunei, is Bahasa Riau. This denotes that the spelling, words, phrasing, grammar, pronunciation, punctuation, sentences, abbreviations, acronyms, capital letters, numbering and style of the language are already standardized.

The standardization of spoken Malay has been mentioned in the corpus planning of Malay language since 1956 and it evolves around the determining of the standard spoken form. More than 30 years has passed before the Malaysian government formally announced the shifting of use of Johor-Riau spoken variation as a standard to *sebutan baku* and to be used in schools and mass media (Mohd Aidil Subhan Mohd Sulor, 2013).

Naturally, the local varieties in Malaysia differ quite significantly in terms of phonetics and phonology. According to Adrian Clynes & David Deterding (2011), these

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differences will allow the varieties of SM spoken in each place to vary. Due to this, Malaysia has two different word final positions, schwa-variety and a-variety.

However, according to Asmah Haji Omar (2015), a-variety is used in radio and television news reading as well as in schools and formal contexts. While Teoh Boon Seong (1994) states that the SM is characterized by the schwa variety in word final orthographic while for other dialects is normally realized as [a]. Johor-Riau variation and SM variation can be categorized as schwa-variety and a-variety respectively.

2.3 KELANTAN DIALECT

Figure 2.3.1: Zahid.I & Mahmood. A.H (2016) Districts and the distribution of population of Kelantan in the map of Kelantan

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As mentioned earlier, there are many dialects found in Malaysia and that many studies have been performed. Among the most studied dialects is the Kelantan dialect. Kelantan is situated at the east coast of Peninsular Malaysia and is a neighbour to Thailand by its North border. Abdul Hamid Mahmood (1996) claims that KD continues to attract attention since more and more studies are being conducted for the topic. The Malay language of Malaysia is distinguished by two important elements which are regional and sociolinguistic varieties (Asmah Haji Omar, 1987).

The regional varieties are defined closely to its crucial part which is geography or known as dialectal regions. The Malay language comprises several regional dialects. These dialects are segregated according to the states in Malaysia and this shows variation of Malay language. Kelantan is made up of distinct districts known as Kota Bharu, Tumpat, Pasir Mas, Tanah Merah, Machang, Hulu Kelantan, Pasir Puteh and Bachok. According to Asmah Haji Omar (2015), Kota Bharu subdialects is considered as standard subdialect in Kelantan due to its usage among upper class people in their daily conversations and in trade administration centers.

Figure 2.3.1 above shows the districts as well as the distribution of population in Kelantan and the neighbouring countries near Kelantan. KD is not only spoken in Kelantan area but it is also spoken by the people of other places beyond the region of Kelantan such as the residents of border area in Kelantan/Terengganu, Kelantan/Pahang, Kelantan/Perak and few of districts in South Thailand region such as Sungai Golok, Yala, Narathiwat and Patani (Abdul Hamid Mahmood, 2006). In addition, it is not only spoken by Malays in Kelantan area but also by Chinese, Indian and Thailand community that live around the area (Nik Safiah & Rozita, 2016). There are many similarities between the KD spoken by Malay in Kelantan and the people in Patani. Studies performed by a native Malay descriptive linguist and dialectologist working in

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the area have shown that the dialect of Kelantan has a few unique features that are very distinct from other malay dialect in Peninsular Malaysia (Nik Safiah Abdul Karim, 1965).

Even though KD seems to be unintelligible to most people due to its unique features, but according to Asmah Haji Omar (2015), it shows the most uniformity when compared to other dialects in Malaysia especially in terms of phonology. These differences do not denote major alteration from the standard variety and it is just a common linguistic divergence (Zuraidah Mohd Don, 2003). Even though KD is only considered as local dialect, it is still unique to people of Kelantan due to its large number of speakers and the complexity of its structures (Nik Safiah Karim, 1985). According to Asmah Haji Omar (2015), among all the subdialects in Kelantan, Kota Bharu subdialect is considered as standard subdialect because this subdialect is widely spoken in Kota Bharu district which is the main center for trade administration and culture development of Kelantan.

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2.4 KELANTAN DIALECT PHONEMES

Another study investigated by Suhaila Sulong (2016) titled ‘Malaysian English Monophthongs by Regional Malay Dialect Speakers: Convergence or Divergence?. It compares how male and female speakers of Standard Malay, Terengganu Malay, and Kelantan Malay produce Malay and English monophthongs. The findings demonstrate that for most Malay monophthongs, Terengganu male and Kelantan male differ significantly from SM among male speakers. In contrast to the male groups, the female groups' results show fewer significant differences between them. The only biggest differences are between Kelantan female and SM female speakers. The study also found out that MalE speakers, regardless of their competency level, have similar realisations of English monophthongs.

Other than that, Nur Izyan Izzati Binti Nazilan also conducted a research titled ‘An Analysis Of Malaysian English Monophthongs By Kelantan Dialect Speakers’ (2019). The findings present all the 8 vowel monophthongs in KD shows few similarities with KD’s English vowel chart. According to the findings, KD speakers’ English monophthongs indicated vowel variation with no resemblance found between KD and English language.

A study titled ‘The Phonological Behavior of Nasal Segment in English Loanwords In Kelantan Dialect’ conducted by Sharifah Raihan Syed Jaafar and Sakinah Nik Muhammad Naziman (2015), offered a theoretical analysis to explain English loanwords in one of the Malay dialects; KD. The data elucidated in the study show that nasal segment in word final position is retained in KD. In conclusion, the data revealed that the alveolar nasal appears on the surface, but the dialect prohibits it from appearing at the end of a word.

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In comparison of KD and SM, there are four significant differences between these two such as phonology, morphology, syntax and lexical (Abdul Hamid Mahmood, 2006). In the aspect of phonology; the study of the categorical arrangement of speech sounds in languages and how speech sounds are arranged and used to communicate meaning in the mind, there are two remarkable differences between KD and SM which are in speaking and phonemes (Abdul Hamid Mahmood, 2006).

People in Kelantan pronounce words differently as compared to how they are pronounced in SM. For example, KD speaker pronounce [ɔɤɛ] for [oraŋ] 'orang' and [kitɔ] for [kitə] 'kita' in SM. There are 19 original consonants in KD and according to Nik Safiah Karim (1985), there are also limited numbers of borrowed consonants from Arabic and English. In another study conducted by Abdul Hamid Mahmood (1985), there are two significant differences between KD and SM which are in terms of speech utterance and phoneme. For example, there are many words in KD that are pronounced differently from SM such as /butɛ/ for butang in SM. While for phoneme, KD has 35 phonemes which comprises 8 vowel phonemes, 7 nasalized vowel phonemes and 20 consonants phonemes (Mahmood, 2006) while SM has 31 phonemes with 6 phonemes of vowels and 25 phonemes of consonants. Please refer to table 2.4.1 and table 2.4.2 below for more information.

Table 2.4.1: Vowel Phonemes of KD

Phoneme	Phonetic transcription	Spelling
/i/	/ibu/	'ibu'
/e/	/kile/	'kilir'
/ɛ/	/ɛlɔ/	'ela'

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/a/	/awa/	‘awal’
/ĩ/	/pəlĩ/	‘belit’
/e/	/kaẽ/	‘kail’
/ɛ̃/	/tapɛ̃/	‘tapai’
/ã/	/ɤã/	‘ingin’
/u/	/utõ/	‘untung’
/o/	/laboh/	‘labuh’
/ɔ/	/ɔtɔʔ/	‘otak’
/ũ/	/kusũʔ/	‘akhir’
/õ/	/ǰɔʔõ/	‘redup’
/ɔ̃/	/hɔ̃/	‘ya’
/ə/	/təŋɔh/	‘tengah

Table 2.4.2: Consonant phonemes of KD

Phoneme	Phonetic transcription	Spelling
/p/	/paku/	‘paku’
/b/	/baǰu/	‘baju’
/t/	/tuboh/	‘tubuh’
/d/	/dapo/	‘dapur’

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/k/	/kaki/	‘kaki’
/g/	/gilaʔ/	‘gilap’
/ʔ/	/akaʔ/	‘angkat’
/s/	/sayoʔ/	‘sayup’
/z/	/zaʔ/	‘zat’
/h/	/hapuh/	‘hapus’
/c/	/čulah/	‘culas’
/ǰ/	/ǰula/	‘julai’
/l/	/lapa/	‘lapar’
/ɤ/	/ɤapeʔ/	‘rapit’
/m/	/mudeʔ/	‘mudik’
/n/	/naseʔ/	‘nasib’
/ɲ/	/ɲamɔʔ/	‘nyamuk’
/ŋ/	/ŋaŋɔ/	‘nganga’
/w/	/waʔ/	‘wap’
/y/	/yatẽ/	‘yatim’

According to Abdul Hamid Mahmood (2006), there is a distinction in terms of nasalized vowel between KD and SM. He mentioned that there are nasalized vowels in

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KD while there is no nasalized vowel in SM. Examples for nasalized vowels in KD are as follows:

Table 2.4.3: Nasalized vowels in KD

Phonetic transcription	Spelling	Meaning
/pečãʔ/	'peca'k'	to eat with so much appetite
/kəɤɛkɔ̃ʔ/	'kereko'k'	crooked
/gəɤiɔ̃ʔ/	'gerio'k'	many

In KD, there are nasalized vowels unlike SM. The awareness of these nasalized vowels in KD is once mentioned by Nik Safiah Karim (1965), Hashim Musa (1974), Ajid Che Akob (1977) and Abdullah Al-Qari Haji Salleh (1981) in Kelantan Dialect Speech Dictionary *(Kamus Petuturan Loghat Kelantan)* has written more than a thousand words in KD and some of them are words that contain nasalized vowels (as cited in Abdul Hamid Mahmood, 2006). There are other researchers that study about KD such as Collins and Husin Dollah (1988:879) and they have given some examples of minimal pairs in KD which contain nasalized vowels.

Hilmi (2011) also provides the vowel sounds that are only special in Kelantan Malay in his study called 'The Orthography of Kelantan Malay'. There are three of them, open front vowel /ɛ/, open back vowel /ɔ/ and nasalized vowel. Asmah Haji Omar (2008) states that Kelantan /ɔ/ can also correspond with /a/ in other dialects in closed final syllables such as /muntah/ in SM will be /mutɔh/ in KD. Minimal pairs in KD that contain nasalized vowels carry different meanings as compared to the words that did not contain nasalized vowels (as cited in Abdul Hamid Mahmood, 2006). He also mentioned that the nasalized vowels in KD is phonemic, that it can occur anywhere in

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the words of KD not just after the pharyngeal consonants as well as it can also differentiate the meaning of words as shown in the minimal pairs below:

Table 2.4.4: Minimal pairs in KD

Phonetic transcription	Spelling
/kəʁi/ /kəʁĩ/	‘Keri’ ‘kering’
/paŋe/ /paŋẽ/	‘Panggil’ ‘Pangan’
/ča/ /čã/	‘Acar’ ‘Memancut’
/ʁa/ /ʁã/	‘Berderai’ ‘Ingin’
/ʁu/ /ʁũ/	‘Ru’ ‘Takut’
/pačo/ /pačõ/	‘Pancur’ ‘Pancung’
/wa/ /wã/	‘Wau/layang-layang’ ‘Bau busuk’
/la/ /lã/	‘Helai’ ‘Nyala’

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According to Abdul Hamid Mahmood (2006), from the total of 20 consonant phonemes in KD, only three phonemes that can occur in the final position of word which are /ʔ/, /h/, and /ŋ/. For examples in the words like /kuwaʔ/ ‘kuat’, /tuwɔh/ ‘tuah’, /pəniŋ/ ‘pening’. However, he mentioned that in SM, there are 14 consonant phonemes that can occur in the final closed syllable which are /p, b, t, d, ʔ, g, s, h, ǰ, l, r, m, n, ŋ/ as in /dakap/ ‘dakap’, /səbab/ ‘sebab’, /silat/ ‘silat’, /ǰasad/ ‘jasad’, /kakaʔ/ ‘kakak’, /beg/ ‘beg’, /ulas/ ‘ulas’, /buloh/ ‘buluh’, /kolej/ ‘kolej’, /halal/ ‘halal’, /bakar/ ‘bakar’, /malam/ ‘malam’, /batin/ ‘batin’ and /kuniŋ/ ’kuning’.

2.5 PREVIOUS STUDIES OF THE KELANTAN DIALECT

A study titled ‘Formant Characteristics of Malay Vowels of Perlis, Kelantan and Terengganu’ carried out by Norsuriati Jamil, Izzad Ramli and Norizah Ardi (2019) found that the highest average mean of F1 belongs to KD and this suggests that KD vowels have a lower vowel height as compared to the dialect of Perlis and Terengganu. This tells that generally the vowels in KD are produced by the lower tongue that bring about the openness of the mouth. Other than that, the KD vowels /ə/ and /u/, as well as the Terengganu dialect's vowel /e/, have a high standard deviation of 549.30Hz, 418.13Hz, and 478.90Hz, respectively. This demonstrates that the pronunciations of the vowels /u/, /ɛ/ from Kelantan, and vowel /e/ from Terengganu are widely dispersed from the mean value, indicating the vowels' diversity. Finally, the study found that Terengganu and Kelantan vowels are similar based on the broader range of formants produced in comparison to vowels of the Perlis dialect.

There are several previous Malay studies of KD of Malay. Some fundamental works are Nik Safiah (1985), Ajid (1994), Hashim (1974) and Farid (1980). All of these researches paid close attention to the phonological system of the dialect which is about nasal segment employing the coda position of a syllable. It is important to mention that

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these studies do not include any theoretical discussion in their analyses simultaneously making it purely descriptive.

Nik Safiah (1985) claimed in her study that KD does not permit all consonants to emerge in word-final position of a word. She further mentioned that only hard palate /ɲ/, velar nasal /ŋ/ as well as glottal stop /ʔ/ are allowed to surface at word-final position in the dialect. Farid (1980) also study the appearance of nasal segments at word-final position in KD. He found out that KD deletes nasal segments in word-final position. Similar findings was found in Farid (1980) and Ajid (1994); nasal segments at this morpholigical domain is deleted.

SM has 6 vowels which are /i/, /e/, /a/, /u/, /o/ and /ə/. However, there are two additional vowels in KD (Asmah Haji Omar, 2015). Those vowels are [ɛ] and [ɔ]. Hence, there are 8 vowels in KD all together which are /i/, /e/, /a/, /u/, /o/ and /ə/, /ɛ/ and /ɔ/. Nik Safiah Karim (1985) states that the initial study of KD is pioneered by English administrators named C.C. Brown, A.J. Sturrock and W.E. Peyps in the year of 1912.

Their findings only evolve around their view on the usage of KD and how it helps to ease their daily conversation in that community. Zaharani Bin Ahmad (1991) conducts an instrumental study on Perak dialect, and he found that the people of Perak say [apɛ] (what) and [bilɛ] (when) instead of [apə] and [bilə]. Perak dialect is identified by the vowel of /a/ ended with */ɛ/* following vowel. According to Nik Safiah & Rozita (2016), there are only 3 consonants that can appear as the final letter in a word. Those consonants are /h/, / /ŋ/ and glottal stop /ʔ/.

As claimed by Abdul Hamid Mahmood (2006), scientific studies related to KD only found after the establishment of the Department of Malay Studies at UM that has provided linguistic courses to their students. One of the studies is done by Nik Safiah Karim (1965) titled ‘Loghat Kelantan, Suatu Cerakinan Kajibunyi Bahasa’ (thesis

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M.A.). In her studies, she described the sounds and ways of pronouncing words in KD. She also explained in her thesis that there are some differences in terms of speaking between people who live in the village and in the city of Kelantan.

Second research is called ‘Fonem Dialek Kelantan’ (academic exercises for bachelor’s degree) by Abdul Hamid Mahmood (1971). In his research, he mainly talks about the phonemes in KD and its distribution and according to him, all the nasalized vowels in KD are phonemics. He also wrote a few sentences from a famous folklore in Kelantan known as ‘Awang Si Golok Besar’ in phonetic transcription. Next research titled ‘Pengantar Ciri-ciri Prosodi, Sendi dan Intonasi serta Pengwujudan Ciri-ciri itu di dalam Dialek Kelantan yang dituturkan di Pasir Mas (academic exercises for bachelor’s degree) by Hashim Musa (1971) discussed about the realization of intonation in KD speech. In his study, he recorded continuous speech by the chosen speakers in Pasir Mas, Kelantan and then, he transcribed the speech into phonetic transcription.

Fourth research is also done by Hashim Musa, in the year 1975 titled ‘Morfemik Dialek Melayu Kelantan’ (Master’s thesis). In his study, he elaborates about the morphemes and how all the morphemes are related to one another in order to form words in KD. Apart from that, he also elucidates about two types of allomorphs which are free allomorph and bound allomorph as well as morpho-phonemic processes that occur in KD.

Vowel /a/ before final nasals in closed syllable position are raised and laxed to [ɛ] before the nasal is finally deleted (Teoh Boon Seong, 1994).

Table 2.5.1: Examples of nasal vowels in KD

SM	KD

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Awam (public)	/awɛ/
Awan (clouds)	/awɛ/
Awang (name of a person)	/awɛ/

Three different lexical items can have the similar phonetic forms when they experience the phonological rules of rounding in KD. Similarly, vowel /a/ that is followed by nasal in the last syllable of a word in SM will change to [ɛ] and the nasal sound will be dropped (Nik Safiah Karim, Farid M Onn, Hashim Haji Musa, Abdul Hamid Mahmood, 1985). For example,

Table 2.5.2: Examples of KD words that end in [ɛ]

SM	KD
Malam	/malɛ/
Belacan	/belatʃɛ/
Buta	/butɛ/

The vowel /a/ in the last syllable of a word in SM will change to [ɔ] in KD if the following consonant is glottal (k) or glottal fricative (h) and the vowel /a/ in the last syllable of a word in SM will change to [ɔ] KD (Asmah Haji Omar, 2015). For example,

Table 2.5.3: Examples glottal /k/ and glottal fricative /h/ in SM

SM	KD

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Galak	/galɔk/
Mak	/mɔq/
Gajah	/gajɔh/
Muntah	/mutɔh/
Bahasa	/bahasɔ/
Lemak	/lemɔk/

According to Abdul Hamid Mahmood (2016), these changes commonly happen to vowels of KD and SM.

Table 2.5.4: Changes of SM to KD

KD	SM
(ɛ - ɛ) eg: (kɛtʃɛʔ) – kecek, (cakap)	(e - e)
(ɛ - ɔ) eg: (pɛkɔŋ) – pekong , (lempar)	(e - o)
(ɔ - ɛ) eg: (tʃɔkɛh) – cokeh, (cungkih)	(o - e)
(ɔ - ɔ) eg: (kɔ.tʃɔʔ) – kocok, (goncang)	(o - o)
(ə- ɔ) eg: (pəkɔʔ) – pekok, (pekak)	(e - a)

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(i - ɔ) eg: (ki.tʃɔh)- kicoh	(i - a)
Open syllable (ɛ) eg: makan – (ma.kɛ) Ketam – (kə.tɛ) Orang – (ɔ.ɣɛ)	Closed syllable (an), (am) and (ang)

There are numbers of differences between SM and KD in terms of pronunciation. Thus, this paper aims at identifying how the vowel [ɛ] and [ɔ] in KD correspond to vowels of SM according to different ages and genders.

According to Asmah Haji Omar (2015) and Shahidi & Rahim (2010), vowel /a/ that is followed by nasal consonant /m,n,ŋ/ in final closed syllable will change or is in accordance with [ɛ] in KD. For a clear picture and a better understanding, we can refer to the Figure 4.9.2 below how the phonological change occurs from SM to KD.

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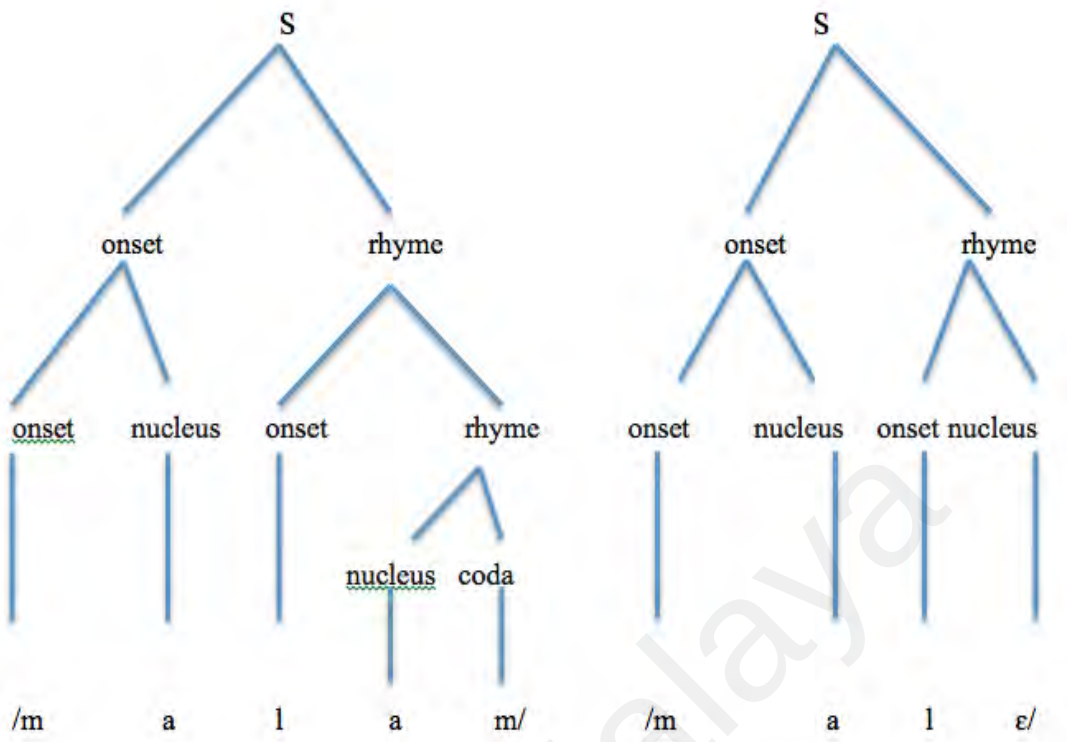

Figure 2.5. 1: Syllable patterns

This phonological process is known as ellision or to be more specific apocope ellision. Ellision is the omission of one or more sounds in a word while apocope here means the loss of one or more sounds at the end of a word. In general, this process usually removes the consonants in the coda position, while at the same time changes the vowel sounds at the nucleus position. Thus, the combined vowel and nasal consonant at the final closed syllable of SM word will undergo an ellision process and it will be replaced with vowel and in this study for KD it will be replaced with the vowel [ɛ]. As a result, /malam/ will be changed to /malɛ/.

Ellision process that occur in this particular study can be realized as :-

/a/ + [nasal] a [ɛ] / _____ #

This phonological process will omit the vowel and nasal sound at the last syllable of a word and replacing them with the vowel [ɛ].

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There are variety of word pattern in SM in the final closed and the final open syllable that will change to the vowel [ɔ] in KD. According to Asmah Haji Omar (2015), vowel /a/ in the final open syllable of SM is in accordance with the vowel [ɔ] in KD. Asmah Haji Omar (2015) also mentions that the vowel /a/ in SM in the final closed syllable is aligned with [ɔ] in KD only if the following consonant in SM is glottal stop /k/ and glottal fricative /h/. One of the examples will be showed below on how the phonological change occurs from SM to KD.

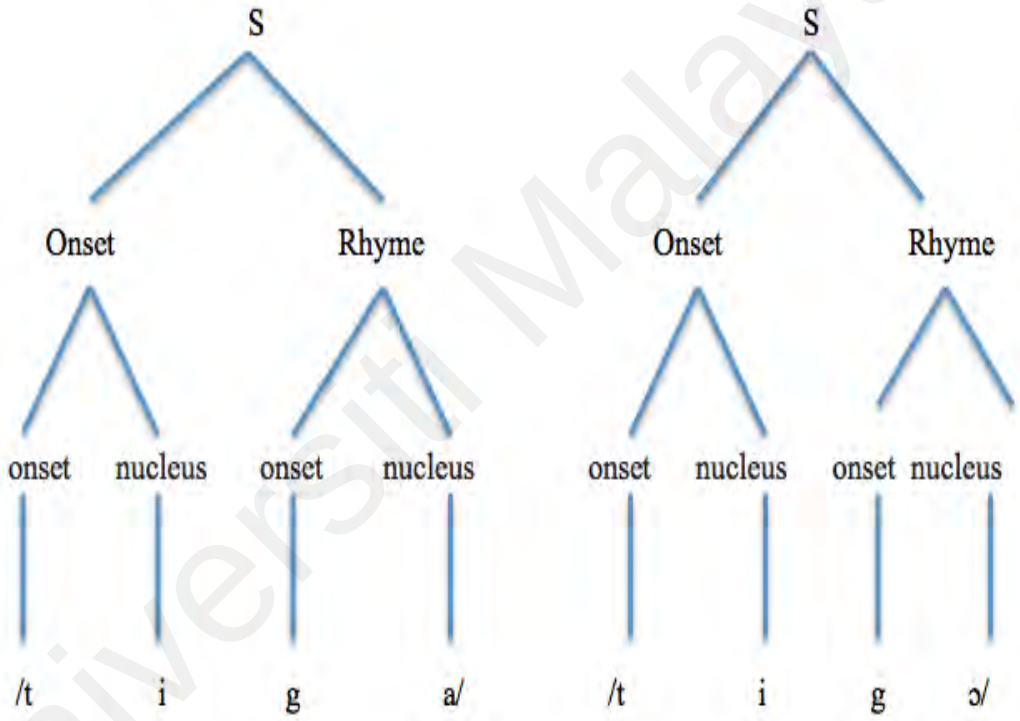

Figure 2.5. 2: Syllable patterns

This process is known as vowel substitution where the vowel [a] in the last syllable of SM will be replaced with the vowel [ɔ] in KD. In other words, the [a] vowel in the last syllable in SM will lose its place of articulation and it will be substituted with another vowel and in this case, it's the vowel [ɔ]. Thus, vowel substitution process can also be seen as:-

/a/ [ɔ] / _____ #

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The words such as ‘dua’, ‘tiga’, ‘tangga’ and ‘kuda’ in SM in this study will undergo this phonological process in order to change to KD.

According to syllable structure, KD has syllable structure of (O)N(Coda) with polar of (C)V(C).

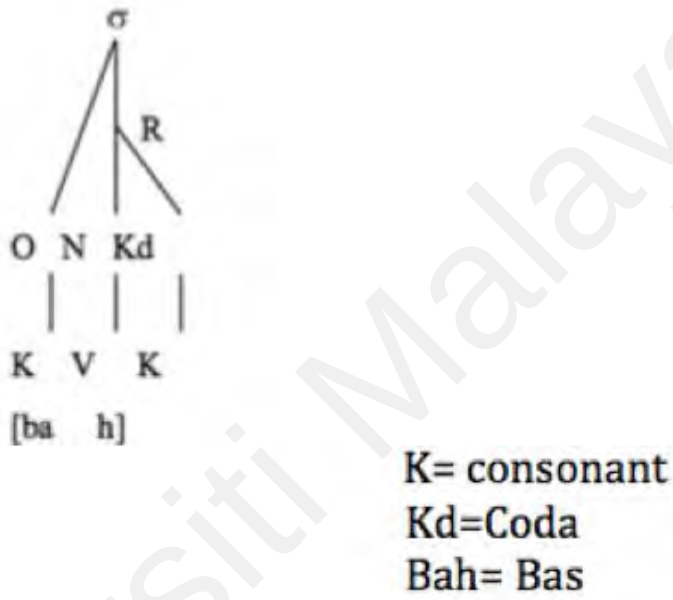

Figure 2.5. 3: Syllable structure of word ‘bus’

According to Teoh Boon Seong (1994), the vowel /a/ in KD will undergo certain phonological changes when it is occurred in certain position in a syllable. Vowel /a/ that precedes the voiceless velar stop /k/ will undergo the backing or rounding rule.

/a/ -----> [+back/round] / _____ (h, ʔ) #

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2.6 FORMANT FREQUENCY MODEL

Formant Frequency Model is adopted in this study to examine the acoustic properties of the vowels [ɛ] and [ɔ] in KD and to what extent it is different from SM. This model is by far the most effective way to analyze the relation between vowels. Ladefoged's (2010) proposed that there are three key parameters of vowel quality measurement which are tongue height, tongue advancement/retraction and lip rounding. In comparison, Fant (1960) notes that vowels are also formed by formants. Kent & Read (2002) defines formant as "a glimpse in the acoustic spectrum. A formant is an acoustic characteristic of this use that may or may not be indicative of a resonance of the vocal tract.

Hayward (2000) and Watt and Tillotson (2001) explain that the frequency of the formant varies according to vocal tract and length, and that any difference arising from tongue movement and lip shape affects the frequency of the formation. In a spectrogram the formants are apparent as broad and dark bands running along the length of a vowel. Thus, this method is often used in most acoustic studies as the first two vowels formant (F1 and F2) are considered significant for vowel perception.

Comparison of formant values is precarious across speakers of different sex. In relation of this, formant frequency model has become the best choice to conduct this study that employs both genders, male and female. There is an unstable contrast of formant ideals across speakers of different sexes. For adult females, the length of the vocal tract is about 13 cm and can vary to over 18 cm for adult males (Maragakis, 2008). Women's vocal tracts are shorter; hence, they have higher resonance frequencies than men's (Flynn, 2011). Their formant frequencies are approximately 10 to 15 per cent higher; therefore, they produce clearer speech compared to males (Foulkes & Docherty, 1999; Simpson, 2009; Wang & Van Heuven, 2006).

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The first two resonances are known as the first formant (F1), and the second formant (F2), for a specific vowel or vocal tract configuration. Such formants are counted to the greater at the lower frequency. Different formation patterns are created by the different types of the vocal tract and the various positions of the tongue, and the energy peaks around the frequencies corresponding to the usual frequencies of the vocal tract. Supraglottal cavities identify the different vowels formed during the articulation of the sounds (Ladefoged, 2006).

The first formant (F1) shows the height of the body of the tongue. The low tongue body was used to create it if the vowel had a high first formant. This kind of vowel is referred to as a low vowel. A low first formant, meanwhile, suggests that the high tongue body was used, and the 'high vowel' is known as this sort of vowel (Nursuriati Jamil, Izzad Ramli & Norizah Ardi, 2019). The significance of the second formant is the front or back of the body of the tongue when a vowel is articulated. The vowel with a high second formant indicates that, at the front of the tongue body, the vowel was pronounced and is known as the 'front vowel.' A vowel with a low second formant subsequently means that the vowel was pronounced at the back of the body of the tongue, and this is known as the 'back vowel.'

2.7 CONCLUSION

In this chapter, the background and characteristics of KD and SM were explained and discussed. Not to mention that other related studies on KD sounds and the Formant Frequency Model were also explained in this chapter. SM has 6 vowels which are /i/, /e/, /a/, /u/, /o/ and /ə/. However, there are two additional vowels in KD (Asmah Haji Omar, 2015). Those vowels are [ɛ] and [ɔ]. Hence, there are 8 vowels in KD all together which are /i/, /e/, /a/, /u/, /o/ and /ə/, /ɛ/ and /ɔ/.

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CHAPTER 3:

METHODOLOGY

This chapter reports and explains the method of data and participants selection, data collection and data analysis in this study. This chapter is divided into a few sections that talks about the source of the data, how the data is measured and followed by how the data is transcribed and analyzed.

3.1 PARTICIPANTS

For this study, there are 8 Malay native speakers selected as the participants of this research. First and foremost, 8 participants from Kelantan are employed in this study. The participants are divided to 4 KDPP speakers, 4 KDKL speakers. Same number of male and female participants are divided equally in this study. All participants in this study are aged from 19-25 years old.

Each group, KDPP and KDKL, consists of 2 male speakers and 2 female speakers. In other words, there are an equal number of male and female speakers in each group. All the participants are young adults of KDPP speakers and KDKL speakers. According to Linda Schiebinger (2017), in the research questions posed and the theoretical approaches and methods used, gender as a viewpoint could be embodied. This implies that in the groups being examined, all genders must be represented, and attention must be given to whether the importance of the research findings for women and men would be different.

The demographic details and background of the respondents are recorded for the analysis purposes of this study (See appendix 1). All the speakers in KDPP group are born, raised and living in Kelantan while all the speakers in KDKL group are born and raised in Kelantan, but they have been living in Klang Valley for approximately about

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10 years. For the main reference, all the 4 participants for SM are born, raised and living in Klang Valley.

All the speakers will be selected according to specific criterias; 1) Malay native speakers. 2) Lives in Klang Valley or Kelantan. 3) Age 19 and above. All the participants are Malay native speakers with no hearing incapabilities or speech disorders. This is to ensure all the sounds produced are real and authentic with no defect resulted from hearing incapabilities or speech disorders.

In addition, all KDPP and KDKL speakers are asked beforehand whether or not they converse using KD at home and with their friends of the same dialect. This is to make sure they can represent KD in Kelantan area very well. According to the questionnaire, the daily language use between KDPP and KDKL participants is different. KDPP participants use KD as a means of communication in their daily conversation. They are most likely to use KD at their workplace as well. However, things are different for KDKL participants where they did not use KD to communicate in their daily conversation. This happens because of their working environment and also their house as most of their colleagues and housemates are not people of Kelantan. Hence, they cannot use KD in their daily life and as a result SM are used to communicate with each other. They only use KD when they are with their friends of the same dialect. Consent forms are given to all the respondents to ensure their privacy and to make sure that the data are only used for academic purposes only (see appendix 2).

3.2 READING MATERIALS

There are 20 words with the target vowels /ɛ/ and /ɔ/ in the set of sentences given to all the KDPP and KDKL speakers. A total of 5 short sentences in KD that contain the target vowels, /ɛ/ and /ɔ/ will be given to all the speakers (see appendix 3). There are one sentence that precedes and follows each sentences that contain the target

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vowels, /ɛ/ and /ɔ/, purposely, to avoid the respondents from noticing the vowels that are being analyzed in this study. There are 10 words for each target vowels, /ɛ/ and /ɔ/ and all the words are chosen according to variants of KD. This is to make sure all participants in the study are familiar with the words chosen to avoid any difficulties in pronouncing the words. The data comprised of words embedded with the target vowels /ɛ/ and /ɔ/ in a CVC context to provide a constant phonetic environment. This also helps to make it easier to identify the vowels that are being analysed in this study on a spectrogram.

In addition, CVC context is used for the words in this study because it also helps in providing a clearer indication where the vowels are located in the waveform of the syllable in acoustic analysis. The simple sentences that comprise vowels /ɛ/ and /ɔ/ are created randomly to avoid the respondents from noticing what vowels are being studied. This is to make sure that they will utter all the words naturally. All the sentences are the same except for the way of possible pronunciation by each participant. All the other aspects of the sentences are arranged in a similar structure.

3.3 DATA COLLECTION

Before the recording session takes place, all the participants are given a consent form (see appendix B). This is compulsory for this study as the results are derived from participants' recordings. Informed consent offers sufficiently comprehensive information about the study to participants so they can make an informed, voluntary and reasonable decision to participate. Questionnaires (see appendix A) are also distributed to all the participants, in which, crucially, to determine their demographic background for this study. Among the questions posed in the questionnaire were questions such as the profession, age, place of birth, the primary language spoken at home and the period of residence at the current site. The significance behind this is to ascertain that the

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participants are native speakers of KD, born and raised in Kelantan (KDPP) and born, raised and have been living in Klang Valley for more than 3 years (KDKL).

The purpose of speakers' involvement in this study and the nature of this study are explained to all the speakers. This is to briefly provide them the nature and the methods of the recordings just to let them be less nervous and well-informed. The speakers are encouraged to be neutral while reading all the sentences. Precautionary steps were taken to ensure that the recording quality was not significantly affected. By using a Takstar mic SGC-578, mic stand, Sony multivoice recording playback ICD-UX560F and a Sony headset, recordings are taken in a quiet room with curtains to minimize background noises. The microphone is placed approximately 30cm from the speakers' mouths to avoid unnecessary sounds on the surroundings. The recordings are done to eliminate vibrations in a carpeted environment, and the fans are turned off to mitigate any ambient noise. Digital recorder is used to make sure that all the data can be easily handled and transferred to the computer simultaneously downloaded into Praat version 6.0.25 software. Therefore, this will help in providing good quality speech samples for the acoustic analysis. The recordings are sampled at 44,100 Hz and 16 bits. This is again to get the best quality of recordings for instrumental analysis. The recordings will be saved as WAV files into the computer.

The paper with the sentences are given to all the speakers. Each speaker is asked to repeat a set of sentences containing 5 sentences for 3 times. They are given a few minutes to prepare before the recording session takes place. The time given is to get them familiarize themselves with all the words in the sentences and to make sure the smoothness of their utterances during the recording session.

To prevent the participants from being careful of their pronunciation, participants are given a list of sentences to read without being told of the target vowels.

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The words are written using the spelling usually used in daily speech by the KD speakers. This phenomenon is named by Krapp (1926) and Bowdre (1964) as Eye Dialect, which means the use of nonstandard spelling for speech to place greater emphasis on pronunciation. The rationale behind this method is to make sure the reading of the word list by all the participants to be more natural.

All the sentences will be printed out on a piece of paper and the speakers will be given 5 minutes for preparation. All of the speakers are allowed to ask and practice the words that they may not be familiar with before the recording sessions start. However, all the speakers would not be corrected during the recording sessions if they are still mispronounced the unfamiliar words.

Test recordings will be carried out beforehand to ensure good quality recordings for instrumental analysis. Test recordings are helpful in determining the quality of recordings before the recording sessions take place with the speakers. When the quality of the recordings is satisfactory, then only the recordings of the speakers take place. The speakers will be asked to repeat the sentences three times in order to get the exact pronunciation and to maintain the reliability of data. There are 480 tokens all together for KDPP and KDKL speakers. In addition, the speakers will be requested to have a 3 second of pause after each reading, to avoid a drop in speech intonation due to tiredness.

Kelantan dialect sentences
Di male hok huje, dahe pokok ggerok kuak sebab ombok kuat.
Keda make ike baka tu bukok puko limo.
Ado tigo tanggo rosok kat pade kudo tu.

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Ayoh suroh beli duo ekor aye, lobok ngan belace.
Untok mung pehe, bute baju melayu ayoh jatoh dale tong sapoh tepi mutor.

Table 3.3.1: Sentences in Kelantan Dialect for KDPP and KDKL speakers

No.	Word	Kelantan Dialect
1.	Ombak	ombɔʔ
2.	Pukul	pukɔl
3.	Lima	limɔ
4.	Tiga	tigɔ
5.	Dua	duwɔ
6.	Tangga	taŋgɔ
7.	Sampah	sapɔh
8.	Lobak	lɔbɔʔ
9.	Motor	mutɔ
10.	Kuda	kudɔ
11.	Malam	malɛ
12.	Padang	padɛ
13.	Belacan	belatʃɛ
14.	Butang	butɛ
15.	Makan	makɛ
16.	Ikan	ikɛ
17.	Hujan	hud͡ʒɛ
18.	Faham	pɛhɛ
19.	Ayam	ajɛ
20.	Dahan	dɛhɛ

Table 3.3.2: Word list for Kelantan Dialect and Standard Malay.

3.4 DATA ANALYSIS

3.4.1 TRANSCRIPTION AND ANNOTATION

The speech of all the 8 speakers are orthographically transcribed using Praat (Boersma & Weenink, 2017), and saved as text files. By doing so, the sound, waveforms, spectrograms and text files can be viewed together. Based on the audio files and recorded transcriptions, words containing target vowels in the same syllable of a word for KDPP and KDKL are identified to see to what extent they correspond to one another.

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The analysis of the data is based on the formant frequency model. The F1 inversely reflects the high-low distinction. In other words, the lower the formant value, the higher the vowel. The F2 reflects the front-back distinction. That is, the higher the formant value, the closer the vowel to the front position. On top of that, an increase in F1 corresponds to tongue lowering and jaw opening, while an increase in F2 results from fronting of the tongue body (Watt & Tillotson, 2011)

After that, the waveforms and spectrograms of those are generated. The target vowels are segmented on a spectrogram, with reference to the related waveform and auditory observation (Pillai, Zuraidah, Knowles and Tang, 2010). Following the Formant Frequency Model, measurements of the first and second formant are taken and annotated in the TextGrid object. The Formant Frequency Model is used to analyze the vowels as this model is commonly used in the instrumental analysis of vowels (Watt & Tillotson, 2001; Deterding, 2003; Hawkins & Midgley, 2005). According to Watt and Tillotson (2001), the current practice in instrumental phonetics is defined as:

> individual vowel sounds are reduced to a pair of figures representing the frequencies of the two lowest formants, conventionally known as F1 and F2, in Hertz. Within the acoustic spectrum, formants can be defined as narrow bands in which energy is concentrated during the development of speech sounds while the volumes and resonances decide the frequency of each formant. During sonorous sounds such as vowels, formants produce most energy, and the frequencies of F1 and F2 relative to each other are thought to provide the human speech perception system with the indications needed for the identification of individual vowel qualities. Moreover, the F1 and F2 frequencies are said to correspond closely with the position of the tongue, such that an increase in F1 frequency corresponds to tongue lowering and jaw opening, while an increase in F2 frequency results from fronting of the tongue body. (p. 275)

3.4.2 MEASUREMENTS & ACOUSTIC ANALYSIS

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Generally, the normal practice in acoustic analysis of vowels, the target vowels will be segmented on a wide-band spectrogram, with reference to the related waveform and auditory inspection. Based on auditory analysis of the spectrograms and waveforms of the studied vowels, the first two formants of the vowels are measured. The relationship among the vowels can be examined by comparing their formant values (Olive, Greenwood, and Coleman, 1993). The high-low and front-back distinctions are represented by the F1 and F2 on the spectrogram (Olive, Greenwood, and Coleman, 1993). The F1 relates to vowel height while the F2 is related to vowel fronting.

According to Watt & Tillotson (2011), formants can be interpreted as narrow bands within the acoustic spectrum where the energy of speech sounds is concentrated during the production process. The frequency of each formant is denoted by the volumes and resonances of various vocal tract cavities such as pharyngeal, oral and nasal (Pushparani A/P Subramaniam, 2008). This formant frequency model will help in identifying how the target vowels /ɛ/ and /ɔ/ in KDPP different from the vowels of /ɛ/ and /ɔ/ in KDKL.

According to (Smiths & Hout, 2004; Ladefoged, 2003; Watt & Tillotson, 2001; Yunisrina Qismullah Yusuf & Pillai, 2012), the F1 and F2 of the selected vowels are measured at every midpoint of the formant band and at the midpoint of the vowel. This is because the midpoint is believed to be the most stable point to measure vowels as it is not affected by any preceding and following consonants. To perpetuate the reliability of the vowels, the F1 and F2 of the selected vowels are measured once again and if there are no remarkable differences found in the two sets of measurements, thus, the measurements can be regarded as reliable.

The data are transferred to an Excel sheet and graphs are plotted according to the data collected. The average values for the F1 and F2 of the vowels studied are converted

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into Bark Scale in order to plot the vowels on a vowel chart and Formant values are maintained in Hertz in order to plot the vowels on a vowel chart. While for graph plotting, the value of F1 and F2 are converted into Bark in order to normalize the value (Yamaguchi & Chiew, 2019). The formula used to convert Hz value into Bark is as followed ((Zwicker & Terhardt, 1980):)

Bark = 13*ATAN(0.00076*HZ)+3.5*ATAN((HZ/7500)*(HZ/7500))

Then, the F1 and F2 values of each speaker's vowels are generated to examine the distribution of the vowels produced in this study and to see to what extent do vowels of KDPP and KDKL differ from one another. The measurements will enable comparisons between KDPP and KDKL vowels. Finally, all the data are tabulated and graphs are produced.

3.4.3 STATISTICAL ANALYSIS

In this study, independent t-test samples are performed to examine the significance between KDPP and KDKL vowels. The primary objective of adopting this statistical analysis was to determine the significance in research between means of three or more data sets from similar groups (Harrington, 2010; Bohn & Fledge, 1992). Independent t-test samples are crucial in this study because it decides whether a statistically significant difference exists between the two different classes of means; KDPP and KDKL groups. GraphPad Prism version 8.0.0 for Windows is used to analyze the independent sample t-test.

An independent sample T-test was conducted to compare the differences of mean between F1 and F2 for vowels /ɛ/ and /ɔ/ produced KDPP and KDKL speakers in this study. The aim of the test is to assess if there is statistical evidence that the mean difference is significantly different from zero between paired observations of a

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particular outcome. Statistical test gives a p-value, which is the possibility of finding outcomes as extreme as those in the results, assuming that the outcomes are due to chance alone. A 5 percent or lower p-value is also regarded as statistically significant (Will Kenton, 2020). To assess if the outcome of a data set is statistically important, statistical hypothesis testing is used.

Zint (2020) states that a statistically significant difference does not always imply that it is large, substantial, or useful in decision-making. It simply means that you may be certain that there is a distinction. She further explained that by calculating the effect size of an observed change we can determine not only statistically significant but also noteworthy or meaningful changes. Effect size is standardized instead of presenting the difference in terms of the number of points gained on a test or the number of pounds of recycling collected. To put it another way, all effect sizes are estimated on the same scale, allowing you to compare the efficacy of several programs on the same outcome.

If two groups have identical standard deviations and are the same size, Cohen's is the suitable effect size measurement. If each group's standard deviation differs, Glass's delta, which utilizes solely the control group's standard deviation, is an alternate metric to consider. When there are different sample sizes, Hedges' g is an option that provides a measure of effect size that is weighted according to the relative size of each sample. Hence, Cohen's measurement is employed in this study.

On top of that, a value of 0.5 is commonly used because it implies a moderate to big difference. According to Mysiak (2020), smaller p-values (0.05 and below) do not reflect substantial or significant impacts, while high p-values (0.05+) do not imply unimportant importance and/or tiny effects. Even very modest effect sizes can create significant p-values if the sample size is large enough (0.05 and below). In other words, statistical significance investigates the likelihood that our findings are attributable to

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chance, whereas effect size indicates the significance of our findings. According to Cohen, d=0.02 is a tiny impact size, 0.5 is a medium effect size, and 0.8 is a big effect size. This indicates that even if the difference between two groups' means is statistically significant, the difference is inconsequential if it is smaller than 0.2 standard deviations (Mcleod, 2019).

The difference between effect size and statistical significance is that statistical significance tells you how likely a result is due to chance, whereas effect size tells you how important the result is (Adrian Madsen, Eleanor Sayre, & Sam McKagan, 2016). An effect size is a measure of how important a difference is: large effect sizes suggest the difference is important; small effect sizes mean the difference is insignificant. The raw difference between group means, or absolute effect size, as well as standardized measures of impact, which are derived to convert the effect to an easily understood scale, are all examples of effect size.

The effect size informs readers about the extent of changes discovered, whereas statistical significance determines whether the results are likely to be random. Both are necessary for readers to fully comprehend the significance of your work (Sullivan & Feinn, 2012). Because effect sizes are standardized and easy to compare, they are used as the raw data in meta-analysis research. A meta-analysis can be used to estimate the average impact size of a certain finding by combining the effect sizes of numerous related researches (Bhandari, 2020).

To determine the standardised mean difference between two groups, subtract one group's mean from the other's (M1 – M2) and divide the result by the population's standard deviation (SD).

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$$\text{Effect Size} = \frac{\text{[Mean of KDPP group] – [Mean of KDKL group]}}{\text{Standard Deviation}}$$

Effect size is employed in this study is to identify the difference between the production of vowel /ɛ/ and /ɔ/ produced by KDPP and KDKL speakers. Effect size is very crucial in determining the findings and to answer research questions in this study because the distinction of some findings may be small. The magnitude of the experimental effect is measured in effect size, which is a quantitative measure. The greater the association between two variables, the larger the effect size. When comparing two groups, the effect size can be used to determine how different they are (Mcleod, 2019).

3.4.4 CONCLUSION

In this chapter, the methods used to evaluate the vowels /ɛ/ and /ɔ/ in KD is clarified. The data collected from KD speakers for both groups, KDPP and KDKL are used to identify the vowel qualities of /ɛ/ and /ɔ/ phonemes in KD and their acoustic properties. In addition, the data collected from all the speakers are also reveal to what extent the difference of /ɛ/ and /ɔ/ vowel realization between KDPP and KDKL speakers. In order to get the data from all the speakers, the target vowels are obtained from 8 speakers consisting of KDPP and KDKL speakers. Each participant is required to repeat the words thrice to determine the accuracy of their pronunciation. Based on the Formant Frequency Model, the F1 and F2 values are derived from each vowel's midpoint since it is considered a vowel's steadiest condition. The results of this study are presented and discussed further in the chapter that follows, chapter 4.

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CHAPTER 4:

FINDINGS AND DISCUSSION

4.1 Overview of Formant Values of KDPP and KDKL

Table 4.1.1: Mean values for F1 and F2 of Targeted Vowels in Hz and Bark and Standard Deviation in brackets.

Target Vowel	**Speaker**	**F1 (Hz)**	**F2 (Hz)**	**F1 (Bark)**	**F2 (Bark)**
[ɛ]	KDPP	563.26 (86.25)	2062.15 (218.93)	4.9869 (0.6023)	13.2573 (0.6844)
[ɛ]	KDKL	553.95 (66.61)	2062.35 (264.84)	5.1895 (0.5573)	13.2380 (0.8214)
[ɔ]	KDPP	563.95 (99.91)	1205.27 (233.29)	5.2616 (0.8277)	9.6323 (1.1859)
[ɔ]	KDKL	532.33 (66.98)	1108.38 (180.44)	5.0057 (0.5693)	9.1114 (1.0257)

Table 4.1.1 illustrates the overall mean and standard deviation of F1 and F2 in Hz and Bark of all target vowels; /ɛ/ and /ɔ/ in this study. As discussed in the previous chapter, the value of F1 and F2 depicted the position of vowels in the vowel chart. Table 4.1.1 shows the mean for F1 and F2 of all targeted vowels in Hz and Bark as well as the standard deviation of each sound in brackets. According to Deborah Rumsey (2016), standard deviation evaluates how concentrated the data are around the mean. A large standard deviation shows that the values in the collected data are farther away from the mean and vice versa. Mean is the average set of numbers and is calculated because it is very crucial for comparing different quantities of data but of the same category. In

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general, the vowel qualities of /ɛ/ produced by all the KD participants in this study are almost similar and there are slight differences that are worthy to note for the vowel qualities of /ɔ/ produced by all the participants.

Vowel /ɛ/ produced by all the KDPP and KDKL speakers has no significant different in F1 (Bark) (M = 4.9869 Bark, SD = 0.6023) and (M= 5.1895 Bark, SD = 0.5573) respectively, t (238) = 0.9357, p = 0.3504 . However, vowel /ɛ/ between KDPP and KDKL participants indicate similar result and is not significant in F2 Bark (M = 13.2573 Bark, SD = 0.6844), (M = 13.2380 Bark, SD = 0.8214) respectively, t(238) = 0.0064, p = 0.9964.

Vowel /ɔ/ produced by all the participants in this study is very much significant when compared to vowel /ɛ/. Firstly, the result of F1 for vowel /ɔ/ produces significant differences between KDPP and KDKL speakers (M = 5.2616 Bark, SD = 0.8277), (M = 5.0057 Bark, SD = 0.5693) respectively, t (238) = 2.8801, p = .0043 Similarly, F2 for vowel /ɔ/ between KDPP and KDKL produces different number in means and standard deviation (M = 9.6323 Bark, SD = 1.1859), (M = 9.1114 Bark, SD = 1.0257), t (238) = 3.5985, p = .0004.

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4.2 Vowel qualities of /ɛ/ and /ɔ/ phonemes in Kelantan Dialect

Table 4.2.1: Mean values for F1 and F2 of Targeted Vowels in Hz and Bark and Standard Deviation in brackets for Male and Female in KDPP and KDKl.

Target vowel	**Male**				**Female**			
	F1 (Hz)	**F2 (Hz)**	**F1 (Bark)**	**F2 (Bark)**	**F1 (Hz)**	**F2 (Hz)**	**F1 (Bark)**	**F2 (Bark)**
/ɛ/ KDPP	530.2 (71.8)	1927 (135.4)	5.0 (0.6)	12.8 (0.4)	596.3 (87.3)	2197.4 (202.9)	5.5 (0.7)	13.7 (0.6)
/ɛ/ KDKL	547.5 (53.2)	1826.7 (99.6)	5.1 (0.5)	12.5 (0.3)	560.4 (77.7)	2298.0 (136.5)	5.2 (0.6)	14.0 (0.4)
/ɔ/ KDPP	544.4 (87.6)	1261 (282.4)	5.1 (0.7)	9.9 (1.4)	583.5 (108.1)	1149.6 (154.1)	5.4 (0.9)	9.4 (0.9)
/ɔ/ KDKL	534.6 (61.0)	1064.0 (143.1)	5.0 (0.5)	8.9 (0.9)	530.1 (72.9)	1152.8 (202.9)	5.0 (0.6)	9.4 (1.1)

This study employed different gender, male and female between KDPP and KDKL speakers. All the findings in this study are the results of male and female from these two groups, KDPP and KDKL. Therefore, findings in this section will be divided according to different gender within the same variety of speakers. Figure 4.2.1 and Figure 4.2.2 depicts the scatter plot of mean for all vowels for female and male participants respectively. As we can see in Table 4.2.1, there is no exact similar mean between male and female for all the vowels studied in this study. There are only two vowels that are being studied in this research which are /ɛ/ and /ɔ/.

Gender difference and the vowel environment can be one of the reasons that influence this disparity to occur in this study. According to Liu, Russo & Larson (2010),

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age and gender are very important in the study of sounds because it will give an impact to both structure and function of the voice and speech mechanisms. Gender can be used as a measuring stick to see the variations and acoustic multiplicity of the existing sound. As a result, different genders that are employed in this study have affected the findings. The differences in the findings of this study will be discussed in the next section.

4.2.1 KDPP speakers

4.2.1.1 /ɛ/ vowel qualities of KDPP speakers

First and foremost, the mean and standard deviation of F1 for male speakers for vowel /ɛ/ is lower as compared to female speakers in this study, (M = 5.0 Bark, SD = 0.6) (M = 5.5 Bark, SD = 0.7) respectively, t (59) = 4.9785, p = .0001. We can note a difference in the mean and standard deviation of F2 KDPP /ɛ/ for male and female participants in this study (M = 12.8 Bark, SD = 0.4), (M = 13.7 Bark, SD = 0.6) respectively, t (59) = 9.1228, p = .0001. According to the findings, the mean and standard deviation of F2 KDPP /ɛ/ shows that female speakers have higher number as compared to male speakers. Thus, both F1 and F2 for vowel /ɛ/ records the same findings where its mean and standard deviation for male speakers is lower than the mean and standard deviation for female speakers.

As we can see, F1 and F2 of vowel /ɛ/ has differences between male and female KDPP speakers in terms of mean and standard deviation in this study. The mean value between male and female speakers for vowel /ɛ/ among KDPP speakers has a distinguished result where male speakers have lower value of mean as compared to female speakers. Therefore, the vowel /ɛ/ production by female speakers in KDPP group is produced lower in the mouth and is more fronted as compared to male speakers in KDPP group. Apart from that, the standard deviation for male speakers is lower than the standard deviation of female speakers in KDPP. This shows that the value for vowel /ɛ/

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for male speakers is spread around nearer to its mean as compared to female speakers in this study.

4.2.1.2 /ɔ/ vowel qualities of KDPP speakers

For KDPP vowel /ɔ/, both mean for F1 and F2 depicts quite a prominent differences when in comparison between KDPP male and female speakers in this study. The mean value for vowel /ɔ/ between male and female among KDPP speakers has a slight difference. Mean and standard deviation of F1 for vowel /ɔ/ in KDPP between male and female speakers is (M = 5.1 Bark, SD = 0.7), (M = 5.4 Bark, SD = 0.9) respectively, t (59) = 2.6514, p = .0103, indicating that these vowels were produced similarly. Correspondingly, mean and standard deviation of F2 for vowel /ɔ/ in KDPP between male and female speakers is also significant, (M = 9.9 Bark, SD = 1.4), (M = 9.4 Bark, SD = 0.9) respectively, t (59) = 2.6974, p = .0091.

As we can see, F1 and F2 of vowel /ɔ/ has great differences between male and female KDPP speakers in terms of mean and standard deviation in this study. Therefore, the mean value in this study tells that the male speakers show the production of vowel /ɔ/ that is a higher vowel and more fronted vowel as compared to female speakers. Apart from that, the standard deviation for male speakers is notably lower than the standard deviation of female speakers in KDPP for F1 value. On the contrary, the standard deviation for male speakers is notably higher than the standard deviation of female speakers in KDPP for F2 value. Lower number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are concentrated enough around the mean of the data set. This tells that the pronunciation of vowel /ɔ/ of male speakers is less diverse as compared to female speakers in this study.

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4.2.2 KDKL speakers

4.2.2.1 /ɛ/ vowel qualities of KDKL speakers

There is a significant difference in the mean and standard deviation of F1 for KDKL /ɛ/, (M= 5.1 Bark = 0.5), (M = 5.2 Bark, SD = 0.6) between male and female participants respectively, t (59) = 1.5132, p = .1356. Similarly, we can note a difference in the mean and standard deviation of F2 for KDKL /ɛ/ vowel for male and female speakers (M = 12.5 Bark, SD = 0.3), (M = 14.0 Bark, SD = 0.4) respectively, t (59) = 29.0886, p = .0001. Hence, the results display that male speakers have lower mean and standard deviation as compared to female speakers for both F1 and F2.

As we can see in Table 4.2.1, the mean value between male and female among KDKL speakers shows a different number in its findings especially for F2; female speakers have significantly higher numbers of mean when compared to male speakers. Generally, female speakers show higher numbers of mean for both F1 and F2 as compared to male speakers among the KDKL group in this study. Therefore, it can be concluded that the vowel /ɛ/ produced by female speakers is a low vowel and is more fronted than male speakers among KDKL group in this study.

The standard deviation for male speakers is notably lower than the standard deviation of female speakers in KDPP for F1 and F2 value in this study. Lower number of standard deviation for male participants in the production of vowel /ɛ/ suggests that the values are concentrated around the mean of the data set.

4.2.2.2 /ɔ/ vowel qualities of KDKL speakers

Mean and standard deviation for F1 KDKL vowel /ɔ/ has no significant difference when compared between male and female KDKL speakers (M = 5.0 Bark, SD = 0.5), (M = 5.0 Bark, SD = 0.6) respectively, t (59) = 0.4663, p = .6427. However,

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there is a different in the figure of vowel /ɔ/ for F2 between male and female KDKL speakers, (M = 8.9 Bark, SD = 0.9), (M = 9.4 Bark, SD = 1.1) respectively, t (59) = 4.0304, p = .0002.

As we can see, F1 and F2 of vowel /ɔ/ has differences between male and female KDKL speakers in terms of mean and standard deviation in this study. There is not much of a difference of mean for F1 for vowel /ɔ/ produced by both male and female among KDKL speakers in this study. The difference in numbers is really small; the mean for male speakers is slightly higher than female speakers. However, the difference in the figure of vowel /ɔ/ for F2 between male and female speakers is quite significant, that the mean for female speakers is higher as compared to the mean of male speakers.

Apart from that, the standard deviation for male speakers is particularly lower than the standard deviation of female speakers in KDPP for F1 value. Lower number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are concentrated around the mean of the data set. This tells that the vowel /ɔ/ value for female KDKL speakers is not concentrated enough as compared to male KDKL speakers.

4.2.3 Summary of 4.2

In conclusion, there is a difference in the value of F1 and F2 for vowel /ɛ/ between male and female KDPP and KDKL speakers in this study. Male speakers record a lower value for the value of F1 and F2 as compared to female speakers. As a result, the standard deviation between these two groups is also dissimilar. Male speakers have a lower number of standard deviations than female speakers. This shows that the value for vowel /ɛ/ for male speakers is spread around nearer to its mean as compared to female speakers in this study. This tells that the pronunciation of male speakers for vowel /ɛ/ is less diverse as compared to female speakers in this study.

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Thus, the same phenomena occur in both groups, KDPP and KDKL; the value of F1 and F2 is lower for male speakers for vowel /ɛ/ as compared to female speakers. As suggested by the findings in this study, it can be concluded that the vowel /ɛ/ produced by male speakers in both groups, KDPP and KDKL is more into high and back vowels as compared to the vowel /ɛ/ production of female speakers.

The standard deviation of vowel /ɔ/ for male speakers is notably lower than the standard deviation of female speakers in KDPP for F1 value. On the contrary, the standard deviation for male speakers is notably higher than the standard deviation of female speakers in KDPP for F2 value. Lower number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are concentrated enough around the mean of the data set. In conclusion, there are differences in the value of F1 and F2 between two gender groups, male and female for both target vowels, /ɛ/ and /ɔ/ produced by all the speakers in KDPP and KDKL.

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4.3 Comparison of /ɛ/ and /ɔ/ phoneme between two varieties of Kelantan Dialect

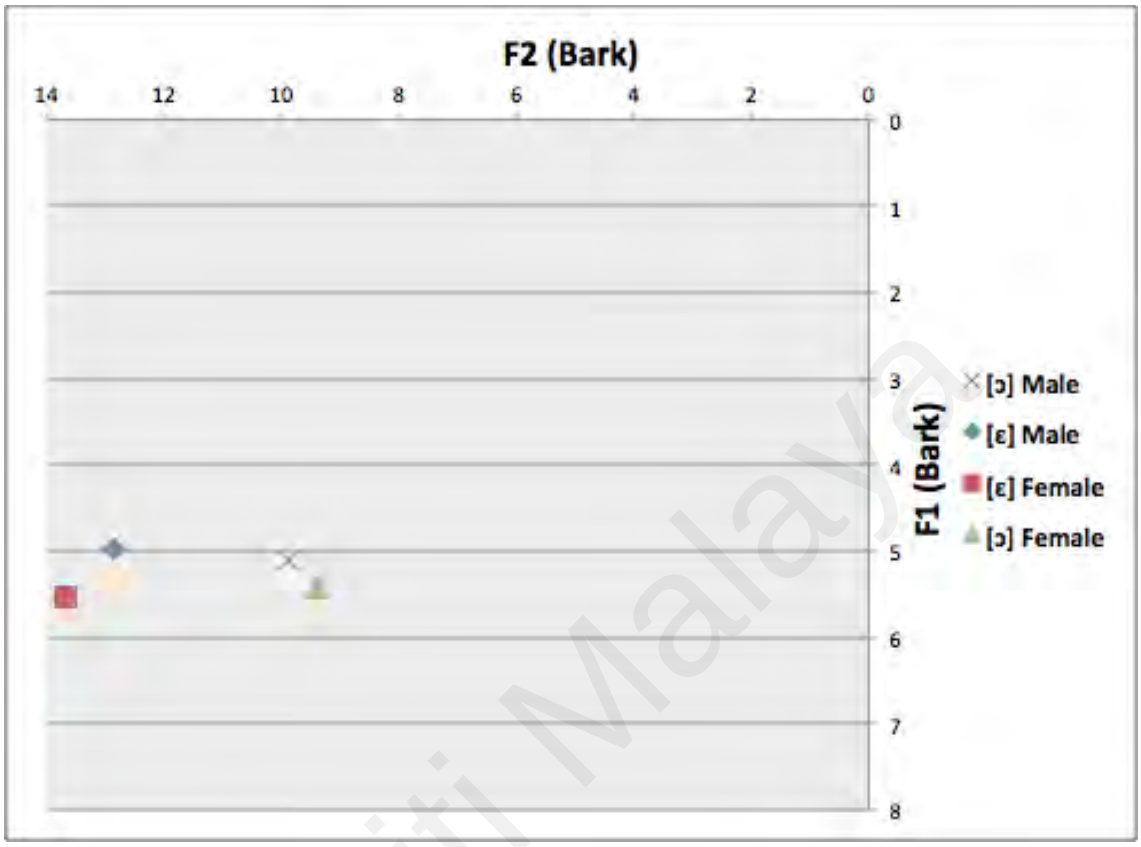

Figure 4.3. 1: Scatter Plot of Mean values of vowel /ɛ/ and /ɔ/ For Male And Female KDPP Speakers

For the statistical analysis in this study, there are few prominent differences that are worthy to note for every vowel of every gender in KDPP and KDKL groups. KDKL participants depict results that are more prominent as compared to KDPP participants for both vowels /ɛ/ and /ɔ/. This study is carried out in order to discern the similarities and the disparities of the findings between male and female of two groups, KDPP and KDKL. The results will show whether the differences of the two groups are significant. Figure 4.3.1 shows the scatter plot of mean values of vowel /ɛ/ and /ɔ/ for male and female KDPP speakers. Based on the analysis and Figure 4.3.1, it indicates that there are significant differences in the findings of mean and standard deviation across gender between KDPP and KDKL. This tells that the pronunciation of male and female has a certain degree of diversity among them.

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In general, there is no significant difference in the score of F1 for vowel /ɔ/ in KDKL between male and female. However, male participants show prominent difference as compared to female participants for the score of F2 for vowel /ɔ/. Apart from that, standard deviation of /ɔ/ for F2 value for all participants in this study shows a higher number compared to /ɛ/ vowel. Thus, higher number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are not concentrated enough around the mean of the data set and it shows higher degree of variability hence explains why it is not distributed at the similar spot as female participants but more fronted and higher than female participants.

Male speakers in KDPP and KDKL for F1 produce vowel /ɛ/ as quite significant, (M = 530.2 Hz, SD = 71.8), (M = 547.5 Hz, SD = 53.2) respectively. Similar case occurs to F2 for male speakers in KDPP and KDKL for vowel [ɛ] as the figure has larger gap and is very significant, (M = 1927 Hz, SD = 135.4), (M = 1826.7 Hz, SD = 99.6) respectively. Hence, it shows that the vowel quality of /ɛ/ is for male speakers between KDPP and KDKL is quite different.

Moving on to vowel /ɔ/ for male speakers between KDPP and KDKL. First and foremost, male speakers in KDPP and KDKL for F1 produce a very prominent figure for vowel /ɔ/, (M = 544.4 Hz, SD = 87.6), (M = 534.6 Hz, SD = 61.0) respectively. Similarly, male speakers in KDPP and KDKL for F2 produce a very prominent figure for vowel /ɔ/, (M = 1261 Hz, SD = 282.4), (M = 1064 Hz, SD = 143.1) respectively. Thus, this tells that the vowel quality of /ɔ/ for male speakers between KDPP and KDKL is not similar, and the pronunciation of the vowel is also slightly different. However, the differences are lower when compared to female speakers. In other words, female speakers produce more significant differences in producing vowel /ɔ/ in this study.

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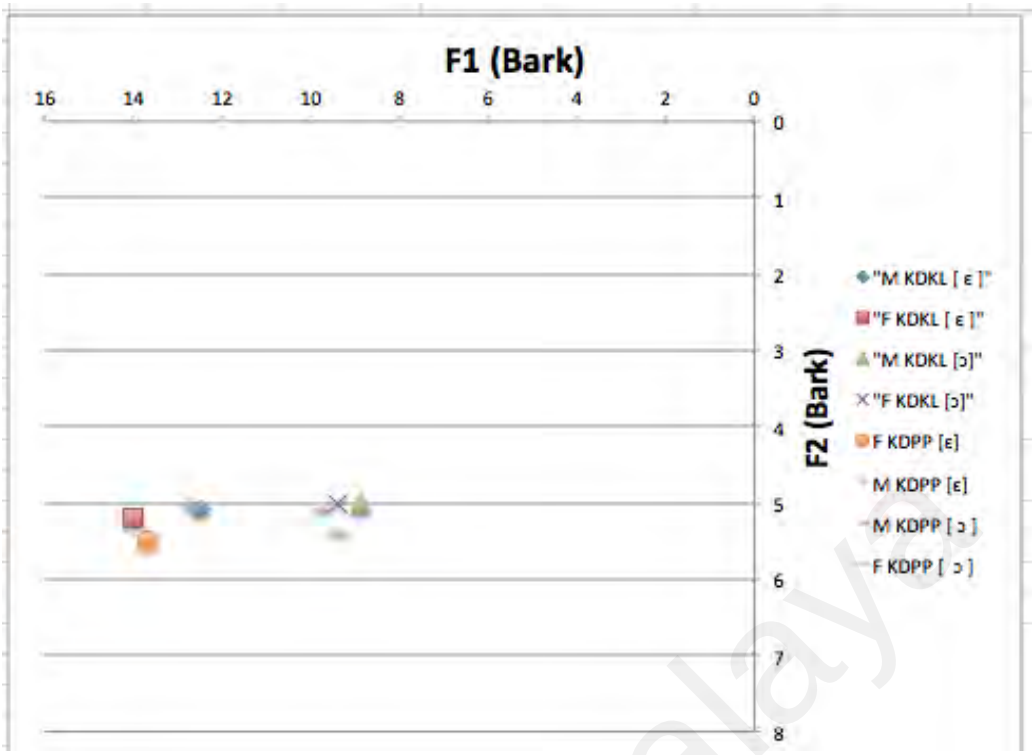

Figure 4.3.2: Scatter plot of mean for all vowels for male and female speakers in KDPP and KDKL

Figure 4.3.2 represents the scatter plot of mean for all vowels produced by all the participants in this study. The /ɔ/ for KDPP vowel for all participants is generally produced lower and a little more fronted than the /ɔ/ for KDKL vowel for all participants in this study. However, the distribution of mean for vowel /ɔ/ for all participants in this study is scattered rather closely to one another. This suggests that vowel /ɔ/ for KDPP and KDKL in this study has lower degree of variability.

There is a slight difference for distribution of /ɔ/ for both genders in KDPP that is worthy to note. The distribution of /ɔ/ for female participants in KDPP is lower and less fronted as compared to the distribution of /ɔ/ for male participants in KDPP. However, there is no difference in terms of height in the distribution of /ɔ/ for both genders in KDKL. This is because Figure 4.3.2 shows that /ɔ/ for female participants in KDPP is distributed a little bit lower as compared to /ɔ/ for male participants in KDPP and for male and female speakers in KDKL. According to Figure 4.3.2, we can also see

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that the locations of /ɔ/ for KDPP and KDKL in this study is moving towards central, instead of, at the back which is the correct location for /ɔ/.

According to the Figure 4.3.2, the location of the vowel /ɛ/ produced by all the female participants in this study is distributed more fronted and slightly lower as compared to male participants. However, the vowel /ɛ/ in this study is located considerably lower than described by Yunisrina (2013) as the distribution is moving towards open, front position. The distribution of /ɛ/ in this study is scattered at the same point according to gender, male and female. Figure 4.1.2 shows that the vowel space of /ɛ/ for all the female participants in this study is rather a little bit far away from the distribution of /ɛ/ for all male participants.

The p value of female participants in Bark for vowel /ɛ/ and /ɔ/ in KDPP and KDKL are both statistically significant and vice versa for male participants for vowel /ɛ/ and /ɔ/ in KDPP and KDKL. First and foremost, the p value of /ɛ/ and /ɔ/ for all female participants is <0.05 which is 0.0189 and 0.0019 respectively. According to this statistical analysis, the p value for all female participants in this study is considered as statistically significant. This result agrees with the findings of mean and standard deviation of /ɛ/ for all female participants as the figure of standard deviation for vowel /ɛ/ for KDPP and KDKL is bigger which is 0.7 and 0.6 respectively.

Standard deviation for vowel /ɔ/ produced by KDPP and KDKL female speakers is also bigger. Hence, it can be concluded that the pronunciation of /ɛ/ and /ɔ/ between the female participants of KDPP and KDKL in this study is not similar. There is a prominent different between female participants of KDPP and KDKL in how they pronounce the vowel /ɛ/ and /ɔ/ in this study. Table 4.3.2 shows that the p value of /ɔ/ for all female participants in this study is smaller than the p value of /ɛ/ which is 0.0019 and according to statistical analysis, the p value of /ɔ/ is considered as very statistically

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significant. Hence, female participants between KDPP and KDKL have greater difference in pronouncing vowel /ɔ/ as compared to vowel /ɛ/. This can be due to some reasons that will be discussed further in the next subtopic.

Following to the statistical analysis of male participants for vowel /ɛ/ and /ɔ/ in this study, the p value of /ɛ/ and /ɔ/ for all male participants in this study is >0.05 which is 0.1359 and 0.4777 respectively. On the contrary with the p value of /ɛ/ and /ɔ/ for female participants, the p value of /ɛ/ and /ɔ/ for male participants shows the opposite. According to the statistical analysis, the p value for all male participants in this study is considered to be not statistically significant. It denotes that the pronunciation of /ɛ/ between male participants of KDPP and KDKL in this study is quite similar, unlike the female participants.

4.3.1 Female speakers

4.3.1.1 /ɛ/ vowel qualities of female speakers

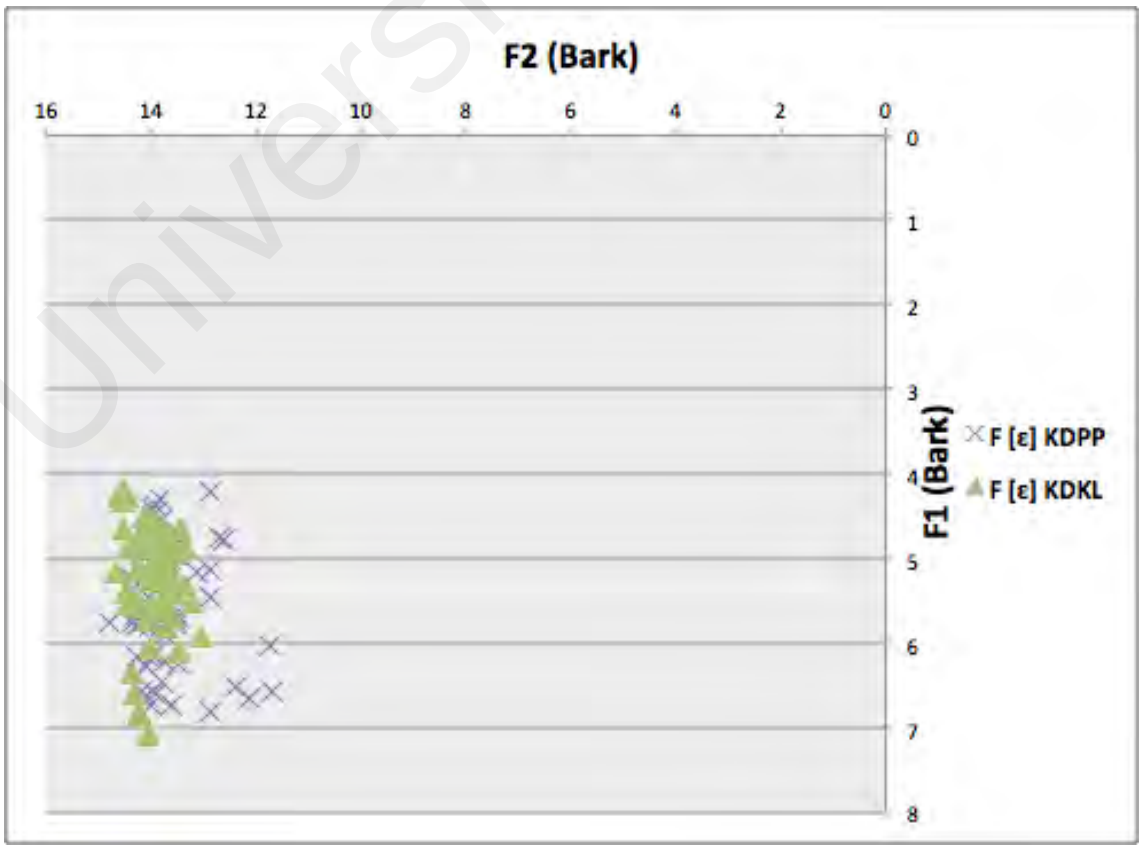

Figure 4.3.1.1: Scatter plot of /ɛ/ for female speakers between KDPP and KDKL

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It is also very crucial to see the differences in mean and standard deviation between the same gender in both KDPP and KDKL groups. As we can see in Figure 4.3.1.1, the frequency produced by female speakers between KDPP and KDKL is quite distinguishable. The distribution for female speakers for vowel /ɛ/ in this study is scattered nicely at the same spot, from open-mid front position to open front position. /ɛ/ is an open-mid front unrounded vowel. However, words such as 'peh**e**', 'deh**e**' and 'ay**e**' make the distribution in Figure 4.3.1 for KDPP group scattered towards open, central positions while they should be overlapping each other at open-mid, front position.

First and foremost, female speakers in KDPP and KDKL for F1 produce vowel /ɛ/ as not significant, (M = 5.5 Bark, SD = 0.7), (M = 5.2 Bark, SD = 0.6) respectively. Unlike F1 for vowel /ɛ/, F2 has a very significant result (M = 13.7 Bark, SD = 0.6), (M = 14.0 Bark, SD = 0.4) respectively, t (59) = 2.3812, p = 0.0189.

As we can notice, the words 'peh**e**' /pɛhɛ/, 'deh**e**' /dɛhɛ/ and 'ay**e**' /ajɛ/ contain glide consonant /j/ and glottal fricative /h/ prior to the target vowel [ɛ]. This has affected the formant values of the vowel. A greater degree of constriction is present in the /j/ glide that gives an impact to the differences of the vowel production. A greater degree of constriction is present in the /j/ glide. A slightly less anterior articulation is observed in the /j/ glide, questioning the application of a representation based on variations in position or articulator that would expect /j/ to be more anterior (Zachary Scott Jaggers, 2018).

/h/ is a voiceless glottal fricative consonant which is produced only with air unlike voiced fricative that are pronounced with vibration in the vocal cords. While /ɛ/ is a vowel, creates by a constant airstream and all are voiced. The preceding consonant which is /h/ is influencing the vowel quality of /ɛ/ in this study. According to Jaye

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Padgett (2008), glides can be distinct from vowels at the phonetic level in terms of constriction degree. On the other hand, Susannah V Levi (2011) mentioned that tongue height cannot determine the difference between glides, fricatives and vowels. Interestingly, Straka finds that the constriction produced during increased articulatory effort can differentiate vowels and glides. When vowels are produced with greater effort, they show less constriction, whereas glides pattern with consonants in being produced with greater constriction during increased articulatory effort (as cited in Susannah V Levi, 2011).

This is because glide or also known as non-syllabic voiced is a sound that is phonetically similar to a vowel sound, but it carries different purpose, as the syllable boundary. According to Padgett (2008), vowels and glides do not carry a very significant difference from the formant quality, rather they are longer as well as more different to a preceding vowel. As a result, according to the F1, the distribution is not prominently dissimilar but rather moving a little lower in the vowel space. As we all know /h/ in the word /dɛhɛ/ is known as glottal fricative and is giving its influence towards the vowel quality of /ɛ/ making it scattered at open, front position. Simultaneously, we know that the F1 value for those words are higher than the rest of it.

As a result, this will trigger phonological consequences in the findings of this study and causes plots of those words, ‘peh**e**’ /pɛhɛ/, ‘deh**e**’ /dɛhɛ/ and ‘ay**e**’ /ajɛ/, to be scattered around the same place, which is towards open, central position which is not the case for vowel /ɛ/. The vowels /ɛ/ in this study are produced differently as well as compared to the ones in Afiqah Jazmin Azli (2017). The vowel /ɛ/ in this study is an open, front position, whereas in Afiqah Jazmin Azli (2017), it is in an open-mid, front position.

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The effect size for F1 /ɛ/ vowel between female KDPP and KDKL (g=0.83) was found to exceed Cohen's (1988) convention for a large effect (g=0.8). While the effect size for F2 of the same vowel showed a significant decreased (g=0.43), a medium effect and encountered fewer variability in the production of the vowel. These results indicate that KDPP female speakers (M=13.7 Bark, SD=0.6) experienced larger variability as compared to KDKL female speakers (M=14.0 Bark, SD=0.4) for the value of F2.

4.3.1.2 /ɔ/ vowel qualities of female speakers

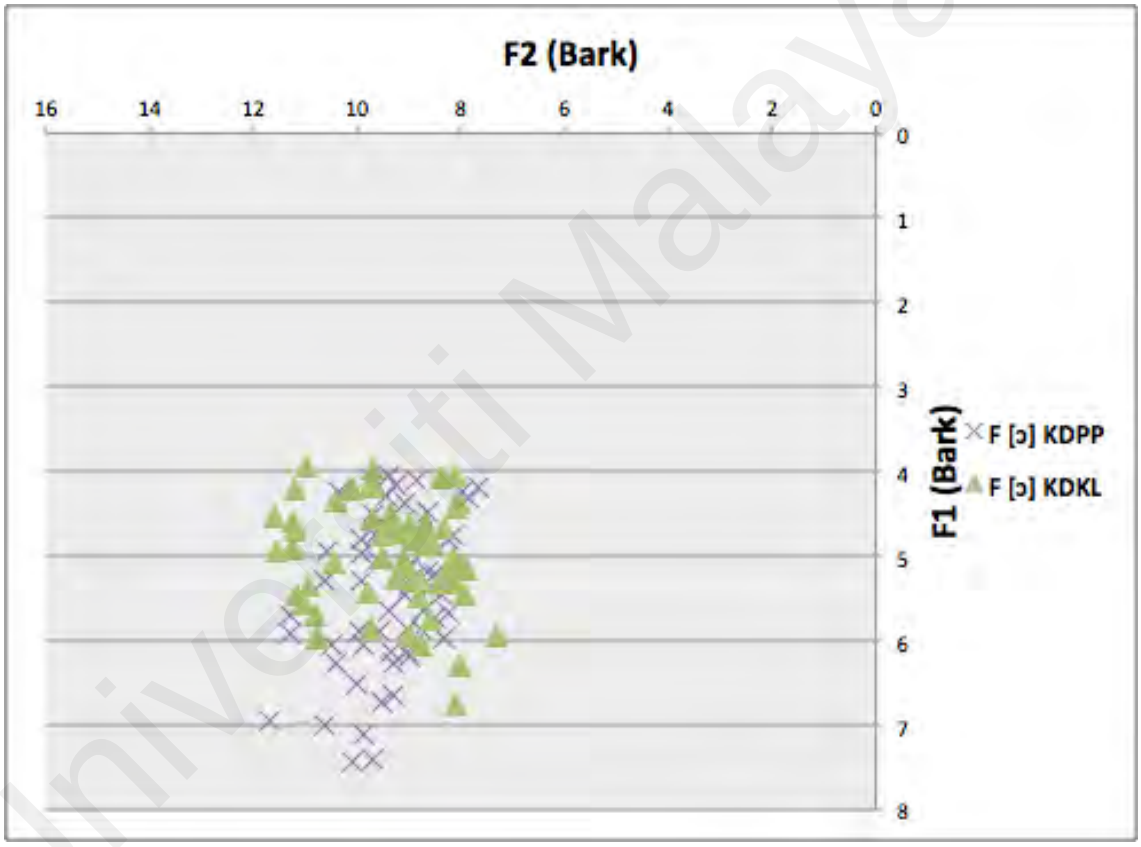

Figure 4.3.1.2 : Scatter plot of /ɔ/ for female speakers between KDPP and KDKL

Figure 4.3.1.2 illustrates the scatter plot of /ɔ/ for female speakers between KDPP and KDKL. It shows that the distribution of /ɔ/ for female speakers between KDPP and KDKL is dispersed but overlapping with one another around open-mid central position to open central position. Firstly, female speakers in KDPP and KDKL for F1 produce vowel /ɔ/ as very significant, (M = 5.4 Bark, SD = 0.9), (M = 5.0 Bark, SD = 0.6) respectively. However, the figure for F2 of vowel /ɔ/ for female speakers

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between KDPP and KDKL is not as significant as F1, (M = 9.4 Bark, SD = 0.9), (M = 9.4 Bark, SD = 1.1). The statistical result of /ɔ/ for female speakers between KDPP and KDKL is t (59) = 3.1746, p = 0.0019. Thus, this tells that the vowel quality of /ɔ/ for female speakers between KDPP and KDKL is not similar, and the pronunciation of the vowel is also slightly different.

There is a high overlapping distribution of /ɔ/ in the vowel space among the female participants of KDPP and KDKL except for several significant inconsistencies and deviations made by female KDPP participants. As we can notice, both of the words 'sap**o**h' and 'lim**a**' has bilabial consonant /p/ and /m/ prior to the target vowel /ɔ/. Bilabial consonants /p/ and /m/ are produced by partially stopping the air coming from the mouth while vowel /ɔ/ is created by the free passage of breath through the larynx and mouth. These bilabial consonants in return change the vowel quality of /ɔ/ in this study, dispersing the plot structure.

As mentioned by Susanne Gahl (2015), it is well known that vowel formants are influenced by consonant context, not only in the immediate vicinity of a consonant, but also at the vowel 's temporal midpoint. Other variables that influence the expansion of vowel space overall, including vowel length, speaking rate, and speakers' gender. Vowel spaces tend to be more compact, for example, less scattered, at faster speaking rates and in the speech of male versus female speakers. Those are the aspects that remain the same (Susanne Gahl, 2015). As a result, the plot distribution of /ɔ/ produced by female speakers of KDPP and KDKL in this study scatters towards open central position instead of open back position with a high overlapping distribution manner.

The effect size for F1 of vowel /ɔ/ for female speakers between KDPP and KDKL is (g=0.58); medium effect. The result tells that the vowel /ɔ/ production between KDPP and KDKL is not quite compelling. While the effect size for F2 is

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(g=0.04) and this small effect size suggests a tiny difference in the production of vowel /ɔ/ for female speakers between KDPP and KDKL. These results indicate that F1 value, (M = 5.4 Bark, SD = 0.9), (M = 5.0 Bark, SD = 0.6) is higher as compared to F2 value (M = 9.4 Bark, SD = 0.9), (M = 9.4 Bark, SD = 1.1) for vowel production of /ɔ/ for female speakers between KDPP and KDKL.

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4.3.2 Male speakers

4.3.2.1 /ɛ/ vowel qualities of male speakers

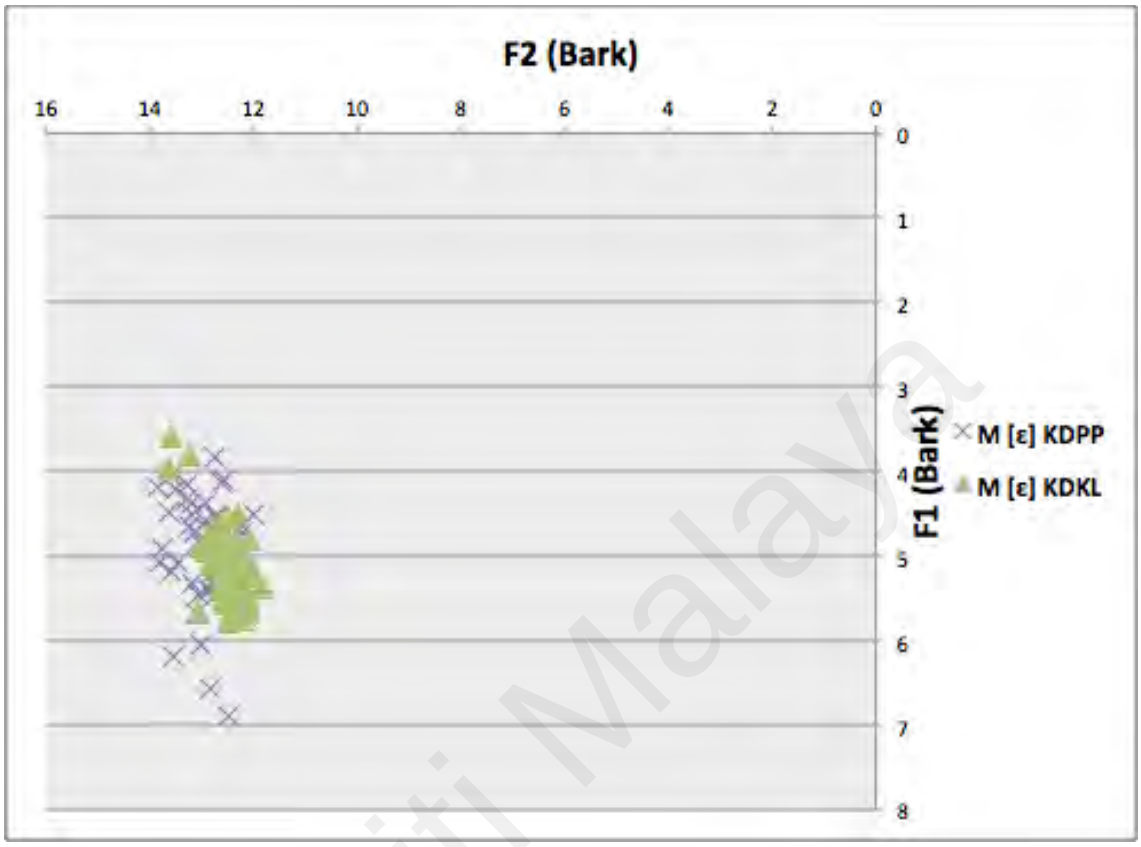

Figure 4.3.2.1 : Scatter plot of /ɛ/ for male speakers between KDPP and KDKL

Figure 4.3.2.1 depicts the scatter plot of /ɛ/ for male speakers between KDPP and KDKL in this study. As we can see, the distribution of /ɛ/ for male speakers in KDPP is nicely scattered at open-mid front position. While the distribution of /ɛ/ for male speakers in KDPP is loosely scattered around open-mid front position and open front position. Some of the plots in the distribution of /ɛ/ for male speakers between KDPP and KDKL are overlapping one another. We can also note that the distribution of /ɛ/ for male KDPP speakers is more fronted as compared to the distribution of /ɛ/ for male KDKL speakers.

Male speakers in KDPP and KDKL for F1 produce vowel /ɛ/ as quite significant, (M = 5.0 Bark, SD = 0.6), (M = 5.1 Bark, SD = 0.5) respectively. Similar case occurs to F2 for male speakers in KDPP and KDKL for vowel /ɛ/ as the figure has

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larger gap and is very significant, (M = 12.8 Bark, SD = 0.4), (M = 12.5 Bark SD = 0.3) respectively. Hence, it shows that the vowel quality of /ɛ/ is different for male speakers between KDPP and KDKL. The statistical result of /ɛ/ for male speakers between KDPP and KDKL in this study is t (59) = 1.5014, p = 0.1359. The large difference in standard deviation of /ɛ/ for male speakers between KDPP and KDKL tells that it has a higher degree of variability.

Moving on to effect size of male speakers between KDPP and KDKL in this study. The effect size for F1 /ɛ/ vowel between male KDPP and KDKL is (*g*=0.27) while the effect size for F2 is (*g*=0.84). As we can see from the effect size of these two formant values, the difference in terms of effect size is significant with F2 being small effect and F2 has large effect. These findings indicate that the difference in F2 (M = 12.8 Bark, SD = 0.4), (M = 12.5 Bark, SD = 0.3) for vowel /ɛ/ production of male speakers between KDPP and KDKL in this study is larger as compared to F1 (M = 5.0, SD = 0.6), (M = 5.1 Bark, SD = 0.5).

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4.3.2.2 /ɔ/ vowel qualities of male speakers

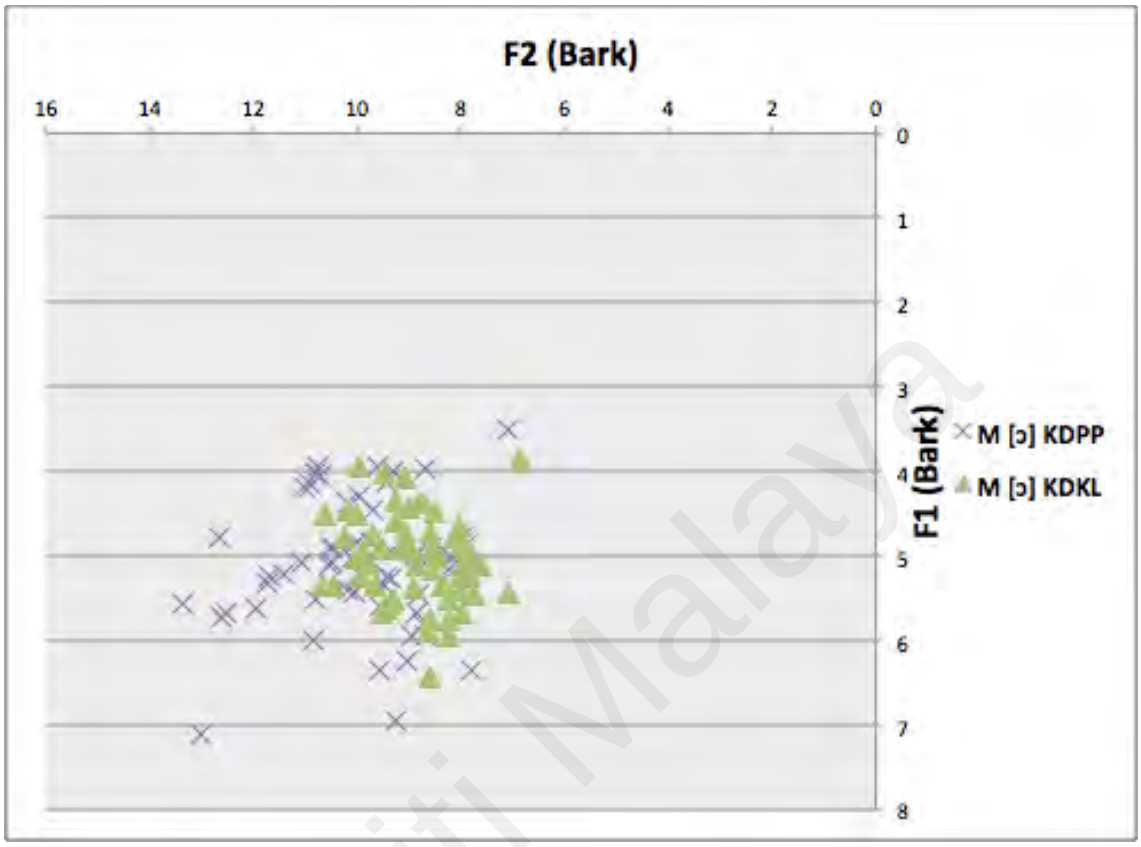

Figure 4.3.2.2 : Scatter plot of /ɔ/for male speakers between KDPP and KDKL

Figure 4.3.2.2 illustrated the scatter plot of /ɔ/ for male speakers between KDPP and KDKL in this study. There is a high overlapping distribution of /ɔ/ in the vowel space among male participants of KDPP and KDKL. As we can notice, the distribution of /ɔ/ for male KDPP is less scattered as compared to the distribution of /ɔ/ for male KDKL speakers. The distribution of /ɔ/ for male KDKL speakers is scattered around open-mid central position while the distribution of /ɔ/ for male KDPP speakers is scattered further at open front position. Other than that, we can also see the distribution of /ɔ/ for male KDPP speakers is more fronted as compared to the distribution of /ɔ/ for male KDKL speakers.

First and foremost, male speakers in KDPP and KDKL for F1 produce a very prominent figure for vowel /ɔ/, (M = 5.1 Bark, SD = 0.7), (M = 5.0 Bark, SD = 0.5)

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respectively. Similarly, male speakers in KDPP and KDKL for F2 produce a very prominent figure for vowel /ɔ/, (M = 9.9 Bark, SD = 0.4), (M = 8.9 Bark, SD = 0.9) respectively. The statistical for F2 is to be considered as extremely statistically significant with the reading of t (59) = 4.8293, p = 0.0189 while the statistical result for F1 is not significant with the reading of t (59) = 0.000, p = 1.000.

This result suggests the high degree of disparity in the location of vowel /ɔ/ produced by male speakers between KDPP and KDKL. Thus, this tells that the vowel quality of /ɔ/ for male speakers between KDPP and KDKL is not similar, and the pronunciation of the vowel is also slightly different.

The effect size for F1 of vowel /ɔ/ for male speakers between KDPP and KDKL in this study is (g=0.13) and this result was found to be inconsequential according to Hedges' g rule of thumb for interpreting results: small effect = 0.2. While the effect size for F2 of the same vowel for male speakers KDPP and KDKL was found to be significant with large effect of (g=0.88). These findings indicate that the difference in F2 (M = 9.9 Bark, SD = 0.4), (M = 8.9 Bark, SD = 0.9) for vowel /ɔ/ production of male speakers between KDPP and KDKL in this study is more significant as compared to F1 (M = 5.1 Bark, SD = 0.7), (M = 5.0 Bark, SD = 0.5).

4.3.4 Summary of 4.3

In general, there is no prominent contrast in the standard deviation of F1 for vowel /ɔ/ in KDKL between male and female. However, male participants show prominent difference as compared to female participants for the standard deviation of F2 of the same vowel. Whereas the p-value for F2 of vowel /ɔ/ between male and female KDKL speakers is 0.0085 and is considered to be statistically significant.

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Thus, higher number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are not concentrated enough around the mean of the data set, and it shows higher degree of variability hence explains why it is not distributed at the similar spot as female participants but more fronted and higher than female participants. However, the differences are lower when compared to female speakers. In other words, female speakers produce more significant differences in producing vowel /ɔ/ in this study.

The distribution of female participants in KDPP and KDKL is scattered almost at the same point, open-mid central position unlike the distribution of male participants in KDPP and KDKL that is loosely scattered. This suggests that female participants produced the /ɔ/ vowel in a more uniform manner as compared to male participants. This tells that male participants have a more diverse pronunciation than male participants. In other words, male participants in this study has higher degree of variability for vowel /ɔ/ as compared to female speakers.

Otherwise stated, the pronunciation of vowel /ɔ/ by male KDPP participants in this study is vary. For the plots that are scattered further away from its distribution are considered as mistakes during the recording session and the tokens are excluded from the analysis. The same pattern occurs for female participants in this study and the same measure is taken. The distribution of female KDPP and KDKL participants is also scattered rather loosely to one another and is moving from close-mid, central position towards open, central position. In terms of uniformity of pronouncing vowel /ɔ/, female KDPP and KDKL participants show more uniformity as compared to male KDPP and KDKL participants considering the distribution of all female participants for vowel /ɔ/ is scattered more closely to one another.

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Moving on to the scatter plot of vowel /ɛ/ produced by male and female speakers between KDPP and KDKL in this study. It shows a very significant difference in terms of the plot distribution and vowel space especially among all the KDPP participants. However, the movement of the distribution is dissimilar between male and female participants in KDPP. First and foremost, the distribution of vowel /ɛ/ in KDPP for female participants is scattered at open-mid front position towards open front position.

While the distribution for male participants in KDPP is loosely scattered at open-mid front position. This may be due to the gender differences that are employed in this study because it does affect the vowel quality in acoustic analysis. Therefore, there is a notably difference in the distribution of the vowel /ɛ/ between male and female speakers for KDPP and KDKL in this study.

4.4 Discussion

This section will wrap up all the noteworthy findings in this study. Two monophthong vowels of Kelantan Dialect were produced by speakers in this research. Those vowels are /ɛ/ and /ɔ/. Most importantly, this study helps to add to the body of knowledge for Kelantan Dialect. There are few similarities between the findings of Kedah Malay and work of Yunisrina (2013).

In terms of location, vowel /ɛ/ produced by all the female participants in this study are distributed more fronted and slightly lower as compared to male participants. However, the vowel /ɛ/ in this study is located considerably lower than described by Yunisrina (2013) as the distribution is moving towards open, front position. The distribution of /ɛ/ in this study is scattered at the same point according to gender, male and female.

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Distributions of /ɛ/ in this study are quite similar to Yunisrina (2013) and Nik Safiah & Rozita (2015), they are almost overlapping to each other. Even though the distribution is placed very close together, the vowel /ɛ/ located considerably lower than described by Yunisrina (2013) as the distribution is moving towards open, front position. In Yunisrina's (2013) study, the finding for vowel /ɛ/ is located at close-mid, font position. The chosen words used to elicit the data in this study could be the reason behind this disparity as it creates more variability in the collected data. This is because the words used to elicit the data in this study and in Yunisrina's (2013) study are two different sets of words. Hence, the distributions of /ɛ/ in this study is in accordance to Yunisrina (2013) and Nik Safiah & Rozita (2015) except that the vowel distribution of /ɛ/ in this study is moving a little bit towards open, front position.

The /ɔ/ for KDPP vowel for all participants is generally produced lower and a little more fronted than the /ɔ/ for KDKL vowel for all participants in this study. However, the distribution of mean for vowel /ɔ/ for all participants in this study is scattered rather closely to one another. This suggests that vowel /ɔ/ for KDPP and KDKL in this study has lower degree of variability.

There is a slight difference for distribution of /ɔ/ for both genders in KDPP that is worthy to note. The distribution of /ɔ/ for female participants in KDPP is lower and less fronted as compared to the distribution of /ɔ/ for male participants in KDPP. However, there is no difference in terms of height in the distribution of /ɔ/ for both genders in KDKL as we can see in Figure 4.3.6. We can also see that the locations of /ɔ/ for KDPP and KDKL in this study is moving towards central, instead of, at the back which is the correct location for /ɔ/.

All these dissimilarities happen due to language interference of SM as this study employed KDKL speakers who are living in Klang Valley more than 3 years. This

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explains why the distribution of mean for both vowels /ɛ/ and /ɔ/ for KDKL speakers is slightly different as opposed to the distribution of mean for both vowels /ɛ/ and /ɔ/ for KDPP speakers. The differences are not much, but there are differences among them that are worthy to note.

Other than that, vowel realisation for both vowels, /ɛ/ and /ɔ/ produced by two groups of KD speakers, KDPP and KDKL has differences to certain extent. First and foremost, vowel realisation for vowel /ɔ/ in this study is quite disparate for both groups of KD speakers. The findings in this study perceive that some of participants of KDKL produce phoneme /ɔ/ rather different than the participants of KDPP, which is they produce phoneme /ɔ/ as [ɞ]. Reason for this is due to the interference of SM that is largely used by the participants of KDKL in their daily communication.

Secondly, vowel realisation for vowel /ɛ/ between KDPP and KDKL participants show some inconsistencies. Even though the difference is not vast but the vowel realization in the findings depicts small contrast between participants of KDPP and KDKL. Schwartz et al. (2015) proposed that the different phonological status of the two phonetic parameters may be related to this difference.

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CHAPTER 5

CONCLUSION

5.1 Introduction

This chapter indicates the summary of the discovery based on the results in Chapter 4. In this chapter, the results of the two research questions are also discussed. Two research questions are answered and explained in this chapter according to gender, male and female, as gender is one of the crucial variables in this study. Furthermore, at the end of this chapter, suggestions for future studies are also included.

5.2 Summary of research questions

This research was conducted to study the acoustic characteristics of the Kelantan Dialect vowels /ɛ/ and /ɔ/ based on the formant frequencies of F1 and F2, and to acoustically investigate the similarities and differences of the vowels in Kelantan Dialect. Other than that, this study is also look at to what extent the difference of /ɛ/ and /ɔ/ vowel realisation between KDPP and KDKL speakers. A total of eight (8) participants are employed in this research.

5.2.1 Research question 1: What are the acoustic properties of the Kelantan dialect vowels /ɛ/ and /ɔ/ produced by KDPP and KDKL speakers?

According to the findings in this research, there is a difference in the value of F1 and F2 for vowel /ɛ/ between male and female KDPP and KDKL speakers. As compared to female speakers, male speakers register a lower value for F1 and F2. As a consequence, the standard deviation is also different for these two classes; male speakers are lower than female speakers. This suggests that in this analysis, the value of vowel /ɛ/ for male speakers is spread about closer to its mean as compared to female speakers for both KDPP and KDKL groups. Hence, the degree of variability in terms of pronunciation for male speakers is lower as compared to female speakers between KDPP and KDKL groups in this study.

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The results for F1 and F2 display that male speakers have lower mean and standard deviation as compared to female speakers for both KDPP and KDKL groups. Thus, the vowel /ɛ/ produced by female speakers is a low vowel and is more fronted as compared to male speakers among KDPP and KDKL group in this study. The vowel /ɛ/ in this study is in open, front position and is considerably lower than described by Yunisrina (2013) and Nik Safiah & Rozita (2015) as well as a little different than in Afiqah Jazmin Azli (2017), it is in an open-mid, front position.

Moving on to vowel /ɔ/ in this research, the mean value in this study tells that the male speakers show the production of vowel /ɔ/ that is a higher vowel and more fronted vowel as compared to female speakers. Mean and standard deviation of F1 for vowel /ɔ/ in KDPP depicts that the value for male speakers is lower as compared to female speakers. On the contrary, the standard deviation for male speakers is notably higher than the standard deviation of female speakers in KDPP for F2 value. Lower number of standard deviation for male participants in the production of vowel /ɔ/ suggests that the values are concentrated enough around the mean of the data set. This tells that the pronunciation of vowel /ɔ/ of male speakers is less diverse as compared to female speakers in this study.

Findings for KDKL group is a little bit distinct where the difference in the figure of vowel /ɔ/ for F2 between male and female speakers is quite significant, that the mean for female speakers is higher as compared to the mean of male speakers. While the mean for F1 is otherwise; male speakers are just slightly higher than female speakers. Other than that, the standard deviation for male speakers is particularly lower than the standard deviation of female speakers in KDPP for F1 value. The findings tell that the vowel /ɔ/ value for female KDKL speakers is not concentrated enough as compared to male KDKL speakers.

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Findings also show that /ɔ/ for female participants in KDPP is distributed a little bit lower as compared to /ɔ/ for male participants in KDPP and both male and female speakers in KDKL. The distribution of /ɔ/ for all participants in this study is dispersed at the open-mid, central position as [ɞ] whereas in Afiqah Jazmin Azli (2017), the vowel /ɔ/ remained as back vowels [ɔ].

5.2.2 Research question 2: To what extent the difference of /ɛ/ and /ɔ/ vowel realisation between KDPP and KDKL speakers?

As for vowel /ɛ/ in this study, there are some tiny distinctions between KDPP and KDKL speakers both male and female. Vowel /ɛ/ for female speakers KDPP and KDKL in this study is realised slightly different from the original pronunciation because its distribution is in open, front position and not in open-mid, front position. Thus, according to its distribution, vowel /ɛ/ in this study are realised as [æ] for female KDPP and KDKL speakers. Therefore, vowel /ɛ/ in this study both for KDPP and KDKL are not realised based on sound patterns of the KD vowels. Female participants for KDPP and KDKL have also significantly performed better than the male participants for both groups in a sense that female distribution of vowel /ɛ/ is nearer to the exact position of /ɛ/.

Vowel /ɛ/ for male KDPP and KDKL speakers are distributed a little bit higher and more back as compared to female speakers for both groups. According to the distribution, vowel /ɛ/ for male speakers in this study for both groups is realised as [œ]. This result suggests that, as a consequence of SM interference, male and female speakers of KDPP and KDKL appear to pronounce the vowel /ɛ/ rather differently; they seem to equate the vowel sound with other vowel as mentioned above.

The same phenomenon happens for vowel /ɔ/ in this study, where there are differences between KDPP and KDKL speakers both male and female. Vowel /ɔ/ in this study are realized rather differently and are not based on sound patterns of the KD

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vowels. This is due to its distribution, in an open-mid, central position. Vowel /ɔ/ in this study is realized as open-mid, central vowel which is not the case for vowel /ɔ/ as it should be positioned at open-mid, back position. In other words, the short back vowel /ɔ/ in this study has been replaced with an open-mid, central rounded vowel [ɞ] for both groups, KDPP and KDKL.

Vowel /ɛ/ in KDPP and KDKL for female speakers, are distributed lower and slightly fronted as compared to male speakers both KDPP and KDKL. While the distribution for vowel /ɔ/ for female KDPP is slightly lower as compared to the rest of the distribution for KDPP and KDKL. The rest of the distribution for KDPP and KDKL is scattered around the same place. Therefore, the findings in this study concluded that the vowels /ɛ/ and /ɔ/ between KDPP and KDKL are realized quite differently from one another and not completely conflated as one.

The effect size for F1 /ɛ/ vowel between female KDPP and KDKL (g=0.83) was found to exceed Cohen's (1988) convention for a large effect (g=0.8). While the effect size for F2 of the same vowel showed a significant decreased (g=0.43), a medium effect and encountered fewer variability in the production of the vowel. Moving on to effect size of male speakers between KDPP and KDKL in this study. The effect size for F1 /ɛ/ vowel between male KDPP and KDKL is (g=0.27) while the effect size for F2 is (g=0.84).

The effect size for F1 of vowel /ɔ/ for male speakers between KDPP and KDKL in this study is (g=0.13) and this result was found to be inconsequential according to Cohen's rule of thumb for interpreting results: small effect = 0.2. While the effect size for F2 of the same vowel for male speakers KDPP and KDKL was found to be significant with large effect of (g=0.88). While, the effect size for F1 of vowel /ɔ/ for female speakers between KDPP and KDKL is (g=0.58); medium effect. The result tells that the vowel /ɔ/ production between KDPP and KDKL is not quite compelling. While

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the effect size for F2 is (g=0.04) and this small effect size suggests a tiny difference in the production of vowel /ɔ/ for female speakers between KDPP and KDKL.

5.3 Recommendations

There are few recommendations that are suggested to the future researchers who have the intentions to study Kelantan Dialect in the future. Future researchers who are interested in studying the acoustic features of Kelantan Dialect should use a different procedure in eliciting data from participants such as using a wider range of words or conducting an interview in detail.

By conducting an interview in detail, researchers can gather more information that is beneficial for the study as well as if the researcher wants to incorporate language contact or language interference in the research. Other than that, future researchers can better understand, and explore research subjects' opinions, behavior, experiences by conducting interview sessions with the participants. The participants are given a series of sentences to read in terms of data collection, and the results deducted from this process do not reflect the way they use spo ntaneous expression. Hence, spontaneous speech is encouraged to use as the method to gain the data for future researchers.

Apart from that, future researchers should also look at different age groups and different subdialects in Kelantan to have a better grasp of Kelantan Dialect. Different age groups and different subdialects will probably have a vast difference in the findings. Future researchers may also want to focus more on the production of /ɔ/ in Kelantan Dialect and and /o/ in Standard Malay to further determine if the two vowels are now conflated as one or not especially due to Standard Malay interference. In addition, they are also advised to study the whole system of vowels in KD. A study on the production of KD vowels from generation to generation by KD and SM speakers is suggested in order to study the changes that may have occurred over time.

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Furthermore, this present study only examined two vowels in KD which are /ɛ/ and /ɔ/. This dialect is also known to consist of nasalized vowels. Future research on the study of the acoustic properties and characteristics of these vowels are deeply encouraged.

5.4 Summary

The findings from this study are hoped to elucidate and enlighten students or researchers who are interested in studying Kelantan Dialect. In addition, the findings of this study are hoped to give supplementary information especially from the angle of gender difference. As studies on Kelantan Dialect are scant and those done on it are mainly impressionistic in nature, this study is also hoped to add new information to Kelantan Dialect's body of knowledge.

Based on the findings, it can be deduced that the vowel /ɛ/ and /ɔ/ between KDPP and KDKL speakers both male and female are realised differently in terms of acoustic and auditory and none of them are conflated completely as one vowel. Even though the differences in the findings are not that significant, still there are some tiny dissimilar results in the findings of this study.

Apart from that, KDKL speakers did not reach the phonetic accuracy of KD even though they have been immensely using KD in their life before they migrated to Klang Valley area either for work or study purposes. This has caused them to have little trouble acknowledging the deviant phonetic realization of SM (Sinha et al. 2009). Only partly of their life that they have been spending it in the surrounding of SM and they inevitably use KD in their daily communication with their families and friends of the same dialect. This also contributes to the findings in this study; there is no vast different between KDPP and KDKL speakers in producing vowels /ɛ/ and /ɔ/.

In conclusion, there is no big-scale different between KDPP and KDKL in producing KD vowel phonemes /ɛ/ and /ɔ/ although KDKL speakers are heavily

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surrounded by SM environment. This phenomena occurs on account of different surroundings and exposure. In the context of KDKL speakers, they probably still use KD even a little in their daily life hence the pronunciation for both vowels in this study is not conflated as one between KDPP and KDKL.

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