RESEARCH REPORT

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A PRELIMINARY STUDY OF PHONOLOGICAL DEVELOPMENT IN KELANTAN CHILDREN AGED 2 TO 5 YEARS OLD

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3) **Tajuk Projek:** A Preliminary Study Of Phonological Development In Kelantan Children Aged 2 to 5 Years Old.

4) (a) Penemuan Projek/Abstrak

*(Perlu disediakan makluman di antara 100 - 200 perkataan di dalam **Bahasa Malaysia dan Bahasa Inggeris** Ini kemudiannya akan dimuatkan ke dalam Laporan Tahunan Bahagian Penyelidikan & Pembangunan sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti).*

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Abstract

Estimated ages of phonemes acquisition is vital as a baseline in making accurate diagnosis for children with phonological disorders and also useful for the speech remediation program. This preliminary study of phonological development aimed to determine the ages of acquisition of 17 phonemes in the Kelantanese dialect and comparison was made between these acquisition ages among English, Arabic and Cantonese children. Samples were obtained from a hundred normal developing Kelantanese children between the ages of 2 to 5. A structured and formal picture-naming test, consist of 35 single word that representing phonemes at all possible initial, middle and final positions in Malay Kelantanese Dialect was used. Speech sample was recorded on a portable cassette recorder and were transcribed using the International Phonetic Analysis system (IPA). Subject was considered to master target phoneme when she or he produced it at least 85% correct at initial, middle or final position. It was noted that by the age of 3, subjects have acquired at least 8 phonemes. Among the earliest phoneme to be mastered is the unvoiced stop /p/ and the last phoneme to be acquired is the fricative /s/. These findings also support Jakobson's universal theory. The ages of acquisition of phonemes among Kelantanese children was quite similar to those for English and Arabic but was relatively delayed from Cantonese.

Abstrak

Jangkaan umur pemerolehan fonem penting sebagai rujukan dalam menentukan kanak-kanak itu mempunyai masalah kecelaruan fonologi atau tidak. Data ini juga penting untuk menentukan tahap keterukan kecelaruan disamping membantu dalam merancang program pemulihan pertuturan. Kajian perintis perkembangan fonologi ini bertujuan untuk mendapatkan umur penguasaaan fonem dalam Bahasa Melayu dialek Kelantan bagi 100 orang kanak-kanak Melayu normal, penutur dialek Kelantan yang dihantar ke taska atau tadika sekitar daerah Kota Bharu berumur antara 2 hingga 5 tahun. Satu set ujian penamaan gambar telah digunakan, untuk mendapatkan 35 perkataan sasaran bagi menguji kehadiran 17 konsonan dalam dialek Kelantan pada kedudukan depan, tengah dan akhir perkataan. Setiap ujaran subjek dirakamkan dan di transkripsikan menggunakan system *International Phonetic Alphabet* (IPA). Sesuatu fonem dikatakan telah diperolehi jika subjek mengujar sekurang-kurangnya 85% betul pada kedudukan depan, tengah atau akhir perkataan. Hasil kajian mendapati pada umur kurang dari 3 tahun, kanak-kanak telah menguasai sekurang-kurangnya 8 fonem. Antara fonem terawal yang dikuasai oleh subjek ialah plosif tidak bersuara /p/ manakala fonem yang paling lewat dikuasai adalah frikatif /s/. Turutan pemerolehan fonem-fonem kebanyakannya selari dengan Teori Universal Jacobson. Secara perbandingan, umur pemerolehan fonem di kalangan subjek adalah lebih kurang sama dengan kanak-kanak berbahasa Arab dan English tetapi agak terlewat jika dibandingkan dengan kanak-kanak berbahasa kantonis.

(b) Senaraikan Kata Kunci yang digunakan di dalam abstrak:

Bahasa Malaysia	Bahasa Inggeris
pemerolehan fonem	phonemes acquisition
kecelaruan fonologi	phonological disorders
perkembangan fonologi	phonological development
dialek Kelantan	Kelantanese dialect
transkrip	transcribe
frikatif	fricative

5) **Output Dan Faedah Projek**

(a) Penerbitan *(termasuk laporan/kertas seminar)*
(Sila nyatakan jenis, tajuk, pengarang, tahun terbitan dan di mana telah diterbit/dibentangkan).

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Oral Health Seminar: Exploring New Frontiers In Oral Health, 25 - 27 February 2003.

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8TH National Conference On Medical Sciences 8 - 9 May 2003.

(b) Faedah-Faedah Lain Seperti Perkembangan Produk, Prospek Komersialisasi Dan Pendaftaran Paten.
(Jika ada dan jika perlu, sila gunakan kertas berasingan)

THE USM CRANIOFACIAL SURGERY COURSE, 13 - 15 July 2002.

As A Presenter.

(c) Latihan Gunatenaga Manusia

i) Pelajar Siswazah

ii) Pelajar Prasiswazah:

iii) Lain-Lain :

6. Peralatan Yang Telah Dibeli:

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.....Canon .Digital. Camera.....

HP Printer 3820

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Canon scanner

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UNTUK KEGUNAAN JAWATANKUASA PENYELIDIKAN UNIVERSITI

Dikuskan tertakluk kepada syarat-syarat berikut.
a) Pembentangan yang memuaskan di PPSG
b) Telah dibentangkan di Seminar/Konferens
c) Satu manuskrip telah dihantar/terbitkan oleh jurnal

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T/TANGAN PENGERUSI
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PUSAT PENGAJIAN

10/09/03

PROF. DR. RUSLI BIN NORDIN
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Abstract

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ACKNOWLEDGEMENT

I would like to take this opportunity to thank Ms. Suzana Mansor for helping me so much in developing the picture cards to be used as the assessment tool in this research and also for helping me in collecting the speech sample. Not forgotten, special thanks to UKM Speech Science students, Nor Farhana and Azmawanie for lending me some of your time to analyze the data. Special thanks to Dr W Mohd Nazaruddin for being so supportive and helpful. Appreciation also goes to all staff of ORL and PPSG who directly or indirectly involved in this project. Most of all, I would like to thank USM for rewarding me this short-term grant to carry out this research.

1.0 INTRODUCTION

A young Malay boy aged four, came to Speech clinic for speech and language evaluation. According to his parents, this boy has some 'problems' with his speech. Mother described his son as 'cannot produce certain speech sounds'. His parents thought that he might be 'pelat' and brought him to the clinic to be evaluated and managed by the Speech-Language Pathologist.

It is quite common for the Speech-Language Pathologist (SLP) to manage this type of case. After collecting the speech sample, the SLP need to analyze the speech pattern and compare it with the normative data for an accurate diagnosis and remediation program. This comparison between the boy's speech pattern and the other normal children's speech pattern will tell the SLP whether the boy's speech really deviate or not, if he is delayed, we wanted to know how much has he delayed from his normal peers or he could actually developing normally. Normative data on the ages of acquisition of speech sounds or phonemes are very useful for estimating approximately how well a child's speech sounds are developing.

Till date, we still do not have our own normative data that represent our Malay children speech sounds developmental pattern. Previously, some of the SLP used English phonological inventory norms as a guideline in making the diagnosis. Realizing that applying other language norms will support cross-linguistic bias, we invented this preliminary study. The data is very useful not only for screening but also for the planning of speech remediation.

Some of us might wonder does Kelantanese dialect differ so much with the standard Malay that we decided to focus our study on this dialect rather than being more 'open' and carry this research in standard Malay so that we can generalize the outcome to the wider population?

Researchers have indicated that dialect plays a role in the description of children's phonology and they have urged the SLP to take dialect features into account when scoring phonological assessment (Haynes & Moran 1989). Failure to account for these dialect features on phonological assessment may result either in some children being mislabeled as a phonologically disordered when, in fact, they are developing normally, or in a change in severity classification for children who exhibit phonological disorders.

For example it is normal for a Kelantanese to say /rumah/ as /ɣumoh/ but it is absolutely 'out of norms' for a standard Malay speaker to say the same. If we run the phonological test to this Kelantanese, we would not target to correct his pronunciation of /ɣ/ because it is accepted in the community where he or she live. But if we run the same test to the standard Malay speaker than targeting /ɣ/ to be corrected as /r/ is necessary.

That is why we focused our study on the acquisition of consonants in Kelantanese dialect instead of in standard Malay language. We see the need to keep data that meet specific requirements in the community because most of the children that come to our speech clinic here are speaking in this dialect.

1.1 LITERATURE REVIEW

A sound knowledge about normal phonological development is essential for carrying out accurate evaluation into disordered speech (Grunwell 1987). Phonological theories are used in the analysis of children's speech to identify and classify systemic patterns to compare with the normal patterns in the adults so that communicative implications can be evaluated. In addition, studies of normal phonological development are used in clinical assessment, diagnosis and treatment for children with disordered speech (Kartini, A. 1991).

A large number of researchers have documented the acquisition and development of phonology in English language (Smit 1986). Among the earliest were the studies done by Wellman et al. (1931), Poole (1934) and Templin's (1957). Wellman et al. (1931) study represents the earliest age at which 75% of the 204 children tested (ages between 2 to 6 years) correctly produced the consonant phoneme in the initial, middle and final position. Where as Poole's (1934) study represent the earliest age at which 100% of the 140 children (age range of 2.5 to 8.5 years old) tested correctly produced the consonant phoneme in all three position. Differ with the present study was that the later one took 100% production and only spontaneous respond were collected as data. Templin's (1957) study represents the earliest age at which 75% of the 480 children tested (ages 3 to 8) correctly produced the consonant phoneme in all three positions. Because these studies involved a big number of children, all of the researchers do not discussed in details about the phonological processes made by their subjects.

According to Simanjuntak, M. (1982), until 1970's, research in phonological acquisition in western countries was looking at the phonemes as an analysis unit (Poole 1934, Templin 1957). This type of study is also known as phoneme-oriented studies. Generally all the studies indicate that the acquisition of phonemes are age related and follow the stages of sounds acqusition.. One of the difficulties with phoneme-oriented studies is that phonological processes such as omissions, substitutions and distortions typically are not differentiated in the presentations of results (Porter, J.H & Hodson, B.W 2001). In order for a phoneme to be considered acquired by phoneme-oriented criteria study is, the child's production on the target phoneme must be 'perfect' (no allowances are made for allophonic variations). Another limitation of phoneme-oriented studies is that they do not adequately account for syllable-structure aspects. Distortion, substitution and omissions are all scored as being equivalent, even though the impact of each type of deviation on intelligibility differs greatly.

Later studies such as by Ingram (1976) and Grunwell (1981) were not only looking at the phonological development but also described the process of phonology. Grunwell's "Chronology of Phonological Processes" and "Profile of Phonological Development" are based on the analysis of phonological development of English-speaking children. The profile provides information about stages of acquisition of consonants in English language. And the chronology depicts the suppression of nine phonological processes in children between 2 to 5 years old. Grunwell reported that by 4 years of age, all of the phonological processes examined were suppressed except the gliding of liquids and stopping for interdental fricatives. In general, the later studies indicate an earlier development of consonants than the earlier studies from the 1930's.

"Despite numerous studies on language other than English, we know relatively little about phonological development in other languages. Some recent research, however, applying the phonetic inventories/ phonological contrasts method to other languages has indicated support for cross-linguistic differences" (Ingram, 1989a. p.124). Because languages differ in their origin and have descended from rather wide-spread area one would expect differences in the language acquisition and development.

The interest to this type of study has increased among the researchers as more published articles were found in 1990's describing the acquisition of phonemes in languages such as Arabic, Cantonese, Spanish and Mandarin. L.K.H So, & Dodd, B.J (1995) studied the phonological development in Cantonese speaking children and found out that the average age of acquiring phonemes in Cantonese speaking children relatively are 2 years earlier than the English speaking children. In general, Cantonese speaking children are the earliest to master stops, fricatives, nasals and approximants as compared to English, Arabic and Spanish children in the phonemes that were shared together (Shereed S. 2000).

Amayreh & Dyson A's. (1998) study the age of phonemes acquisition in Arabic language. The Arabic articulation test was administered to 180 normally developing children who live in or near Jordan. All subjects aged between 2:0 to 6:4 and were divided into 9 age groups. They reported the percentages of accuracy of consonants showed clear developmental trends- the older the children, the better they are in mastering speech sounds and the lesser phonological processes were made. They also reported that medial consonants were significantly more accurate than initial and final consonants and ages of acquisition of Arabic consonants were similar to those for English except for the stops and nasals sound where the Arabic children would have acquired earlier than English speaking children.

In Malaysia research in phonological development among Malay children is still very new. This study for example, relatively is about 70 years behind compared to one of the English earliest studies in phonological development, which was in 1931 by Wellman, et.al. The need to do the research in this area of speech is clear – we need to have our own local data that describe our children phonological developmental pattern. Directly applying other language phonology to our Malay children will surely support less accurate diagnosis or altering the severity of the disorders, which shall lead to unnecessary treatment.

Till date, very little data are available about the acquisition of phonemes in Malay language in children. Most reported studies have focused on the adult phonological system.

Mohd Salleh, M. (1990) studied the phonological development in four Malay children aged 2 to 5 years old who speak in Johor dialect. Neither structured test nor percentages of phoneme usage and the distribution of phoneme in words were stated in this study. Data were collected in a daily spontaneous speech. The two year old and three year old subjects in this study were reported to have acquired all phonemes in Johor dialect except for fricative /s/ which was substituted to /t /. The four and five year old subjects were reported to have mastered all of the phonemes in Johor dialect.

Siti Ramlah, S. (1992) studied the phonological development in 12 Malay children ages 2 to 6 years old who were attending the Taska Sukmanita UKM Nursery in Bangi. Differ with the previous one was that the later was looking at the phonemes acquisition in standard Malay and not in dialect. Like the previous study the later also did not use any structured test to elicit responds from the subjects and also do not mention the percentage of phoneme usage and also the distribution of phonemes in words that were tested. The one year old subjects in this study were reported to have acquired plosives, affricates, nasals and semivowels but not the liquid and fricatives where as the two, three, four, five and six year old subjects were reported to have mastered all the primary phonemes in standard Malay.

2.0 RATIONALE OF THE STUDY

Speech clinic in Otorhinolaryngology (ORL), Hospital Universiti Sains Malaysia Kelantan has been providing clinical services for the past 3 years. The Speech-Language Pathologist (SLP) in speech unit manage a huge volume of patients with different types of communication disorders and among all, the phonological and articulation disorders (commonly known as 'pelat') are the most common cases referred to our speech unit (>75%).

In order to diagnose Kelantanese patients with phonological or articulation disorders, normative data on the ages of acquisition of each speech sounds in Kelantanese dialect is needed. This data is useful as a referral for estimating approximately how 'deviate', 'delayed' or 'severe' our patients as compared to normal children. Also it is useful when planning for the speech intervention. Previously, some of the SLP refer to English phonological inventory chart to help them in making diagnosis since Kelantanese dialect lack of this information. Realizing that every language has it's own developing pattern, and applying other language acquisition ages will highly support cross-linguistic bias, the author with a few colleague invented this preliminary study.

3.0 OBJECTIVE

3.1 GENERAL

To develop a phonological inventory chart that represents all possible consonants in Kelantanese dialect and the estimated normal acquisition ages for each phoneme. The chart is vital as a quick reference especially to Speech-Language Pathologists to determine whether or not a child's articulation is developing within normal expectations. Besides, it can be very useful for the SLP in planning for the remediation for those who have problems in articulation.

3.2 SPECIFIC

1. To determine the ages of acquisition for each phonemes in Malay Kelantanese Dialect (MKD).
2. To determine whether the accuracy of consonants vary by position in the word.
3. To determine whether or not the acquisition of phonemes in Kelantanese dialect follows the Theory of universal by Jakobson.
4. To compare the ages of acquisitions of phonemes among children who speak Kelantanese dialect with children who speak Cantonese, English and Arabic.
5. To determine the most common phonological processes made by normally developing children aged 2 to 5.

4.0 TERMINOLOGY

4.1 PHONOLOGY

Phonology is a study of the acquisition of speech sounds or phonemes, the elements and principles that determine the patterns for use of those sounds (Shereef, S. 2001)

In any language, we can identify a small number of regularly used sounds that we call phonemes. For instance in Malay language, we often used the phoneme /b/ for the words like ***baju, buku, lembu, belon, lambat*** and ***bila***. Phoneme is the smallest unit of sound that can signal a difference in meaning (Roach, P. 1991). Take a look at this minimal pairs ***batu*** and ***satu.*** The only phoneme that differ in this two words are the initial ones – the /b/ and /s/ but because of this differences the words have totally represent two different things. A phoneme is an abstract concept, which actually refers to a family of distinctive, similar sounds and guides the pronunciation of words (Paul, P.V 2001).

Phonemes	Production	Example
Vowels	No obstruction of air stream from larynx to mouth or nasal cavity	/a, I, u/
Consonants	Air stream coming from the vocal cords is modified by the vocal tract	/p,t,d/

Table 1

As illustrated in table 1, phonemes can be divided into two groups- vowels and consonants. Vowels are produced resulting from the unrestricted passage of the air stream through the mouth or nasal cavity without stoppage for example /a/, /i/ and /e/. Where as consonants, are produced by constricting the vocal tract to modify the breath stream coming from the larynx. This study however will only focused on the development of consonants among normal children.

Consonants are categorized based on the manner of articulation, place of articulation and voicing. Voicing is the presence or absent of vocal fold vibration during the production of the phoneme. Where as, place of articulation tells us where exactly in the vocal tract the consonant was produced (see Appendix 1 and 2). These places of articulation are generally labeled as bilabial, labio-dental, dental, alveolar, palatal, velar and glottal. Manners of articulation are labeled to characterize the way consonants are produced. They generally consist of stops, fricatives, affricates, nasals and approximants. There are other manners and places or articulation that may be specific to certain languages only, although these are the most common ones (Small, 1999).

4.2 PHONOLOGICAL DEVELOPMENT

The process of mastering all of the phonemes of the ambient language in children is not only a complex process but involved lengthy of time. This gradual acquisition of the speech sound system is known as the phonological development (see Appendix 3). Researchers believe that children acquired certain sounds earlier than the others. For instance, in English language, phonemes such as /m,n,h,p/ would be acquired by children by the age of two and phonemes such as /s,z.sh.th/ would be acquired later which is by the age of four (Prather et al 1975). One of the famous theories in phonological development was a Universal theory by Jakobson's (1968). He believed that the acquisition of phonemes in all languages follows similar patterns. Regardless of what language the child is exposed to, he or she will master certain sounds earlier than the other.

4.3 PHONOLOGICAL PROCESSES

In learning how to speak like adult, normal children typically will simplify their speech. This is what we call as phonological processes. Phonological processes is a techniques used by children to simplify speech when attempting to produce adult words (Nicolosi, L. et al. 1989).

Phonological processes describe what children do in the normal developmental process of speech to simplify standard adult productions (Shipley, K.G & McAfee, J.G 1998). Therefore a normal child will reduce the usage of these processes as they grow older and the processes will disappear once they acquired adult like speech. Children usually outgrow them and learn to produce the correct adult targets by the age of eight years old (Stoel- Gammon & Dunn, 1985). Bowen C. (1998) reported that the phonological processes are normally gone by the age of five.

Phonological process	Example	Gone by approximately
Consonant harmony	Kittycat = tittytat	3;9
Weak syllable deletion	Elephant = efant Potato = tato Banana = nana	4;0
Gliding of liquids	Run = one Leg = weg Leg = yeg	5;0
Fronting	Car = tar Ship = sip	3;6
Stopping /f/	Fish = tish	3;0

Table 2 A few examples of phonological processes in normally developing children and normally gone by these estimated ages:

4.4 PHONOLOGICAL DISORDERS

Phonological disorders are among the most common communication disabilities diagnosed in preschool and school-age children. The disorders affect approximately 10% of this population. According to American Speech and Hearing Association (ASHA) in the year of 2000, approximately 97% of speech-language pathologists (SLP) in schools served individuals with articulation or phonological disorders. Phonological disorders result from organic or functional etiologies. Some organically based phonological disorders are related to hearing loss, cleft lip or palate, cerebral palsy, tongue-tie, apraxia, dysarthria and others.

The SLP usually used standard articulation test for example Arizona Articulation Proficiency Scale and Templin- Darley Test for Articulation to identify patient's phonological errors. This test assesses target speech sounds or phonemes in the initial, medial and final positions. The SLP use normative data to determine whether or not a child is developing within normal expectations. Normative data on the ages of acquisition of phonemes are very useful for estimating approximately how well a child's sounds are developing. The most common guideline used to determine whether or not a child is having a problem with articulation was that a certain number of speech sounds had to be delayed at least 1 year based on published phoneme acquisition norms (Hodson, Apel & Gordon-Brannan, 1992). Acquisition ages, however vary from study to study (Smit,1986).

However most of the research has been concerned with the English language. Application of this data to children of other cultural backgrounds like Malay children may not be appropriate.

4.5 STANDARD MALAY

Generally the pronunciation of standard Malay is based on the Johor-Riau or southern dialect (Asmah, 1980; Farid, 1980). In other words, most speakers in Malaysia use the Johor-Riau dialect in their daily communication in formal situations.

The consonants of Standard Malay can be divided into two categories called primary and secondary consonants. Primary consonants are similar to Johor-Riau dialect consonants and not recently introduced into the sound system. In contrast, secondary consonants have recently entered the Malay sound system in a small number of loan words, which the manners of production and the points of articulation are varies in individual speakers (Rosmawati A. 2002)

According to Farid (1980), the fricative phonemes /f, v, z, θ, ð, x/ are loan segments in the borrowed lexical items and very limited.

4.6 KELANTANESE DIALECT

Kelantan is one of the state in Malaysia. It is situated at the east coast of Peninsular Malaysia and is a neighbour to Thailand by its North border. Kelantanese dialect is not only spoken by the Kelantanese but also being spoken by people at the borders and in several districts in South Thailand like Sungai Golok, Narathiwat, Yala and Patani (Abdul Hamid, M. 1993).

Studies done by native-Malay descriptive linguist and field working dialectologist have shown that Kelantanese dialect have a few special characteristics that is very different to other Malay dialect in Peninsular Malaysia (Nik Safiah, A.K. 1965). Furthermore Kelantanese dialect is said to be the most hard to understand dialect, compared to other Malay dialects (Pepys, WE, 1916).

Traditionally Kelantanese children will acquire Kelantanese dialect as their first language because of the usage in everyday communication at home. However, these Kelantanese children are also exposed to the official standard Malay, which they heard through mass communication medias such as from the television or radio. Once they enter formal education in schools usually at the age of seven, they will be exposed more to this official standard Malay via text books, VCD and other teaching aids.

4.7 KELANTANESE DIALECT VS STANDARD MALAY

Two most prominent features that differentiate between Kelantanese dialect and standard Malay are the total amount of consonants in these two languages and the distribution of consonants in words.

The inventory of consonants in standard Malay language refers to the use of 25 consonants while Kelantanese dialect, which is the sub-language of the Malay refers to the use of 20 consonants (Ajid, C.K.1985).

Table 3 Consonant chart for standard Malay language

	bilabial	Labio dental	Dental	alveolar	Post-alveolar	palato-alveolar	palatal	velar	Uvular	Glottal
Stops	**p b**			**t d**				**k g**		ʔ
fricatives		**f v**	Ð	**s z**	ʃ				x	**h**
affricates						ʧ ʤ				
Rolled Lateral				**r** **l**						
Nasals	**m**			**n**			ɲ	ŋ		
semivowels	**w**						**j**			

#Where symbols appear in pairs, the one in the right represent voiced consonants.

Table 4 Consonant chart for Kelantanese Dialect (Ajid, C.K 1985)

	bilabial	alveo-dental	Alveolar	palato-alveolar	Palatal	velar	glottal
Stops	**p b**	**t d**				**k g**	ʔ
Fricatives			**s z**			ɣ	**h**
Affricates				ʧ ʤ			
Lateral			**l**				
Nasals	**m**		**n**		ɲ	ŋ	
semivowels	**w**				**j**		

#Where symbols appear in pairs, the one in the right represent voiced consonants.

The consonant inventory of Kelantanese dialect (Ajid, C.K. 1985) overlaps with standard Malay primary consonants (Yunus, M. 1980) except for /r/ which is not a roll approximant as in standard Malay but is velar fricative in Kelantan's dialect.

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The distribution of the consonants in Kelantanese dialect not only differ with the official standard Malay but also with other Malay dialects. All 20 consonants from Kelantanese dialect exist at the initial and middle position but only 3 consonants : /2, h, ng/ exist at final position in words This can be explain as below :

Phoneme	**standard written form**	**standard Malay pronunciation**	**Kelantanese dialect pronunciation**
/p/	atap	atap	ata?
/b/	sebab	sebap	seba?
/t/	dapat	dapat	dapa?
/d/	abad	abad	aba?
/n/	belon	belon	belong
/m/	demam	demam	deme
/ng/	padang	padang	pade
/s/	kipas	kipas	kipah
/l/	bakul	bakul	bako
/r/	bakar	bakar	baka

The most widely ended phoneme is /2/ followed by /h/ and /ng/

5.0 RESEARCH QUESTIONS

1. What are the ages of acquisition for each phoneme in MKD?
2. Does accuracy of consonants vary by position in word?
3. What are the sequences of phonemes learning in MKD?
4. What are the differences in ages of acquisition between MKD, English, Arabic and Cantonese.
5. What are the most common phonological processes made by Kelantanese children aged between 2 to 5 years old.

6.0 METHODOLOGY

6.1 Study design

This is a descriptive, cross sectional study.

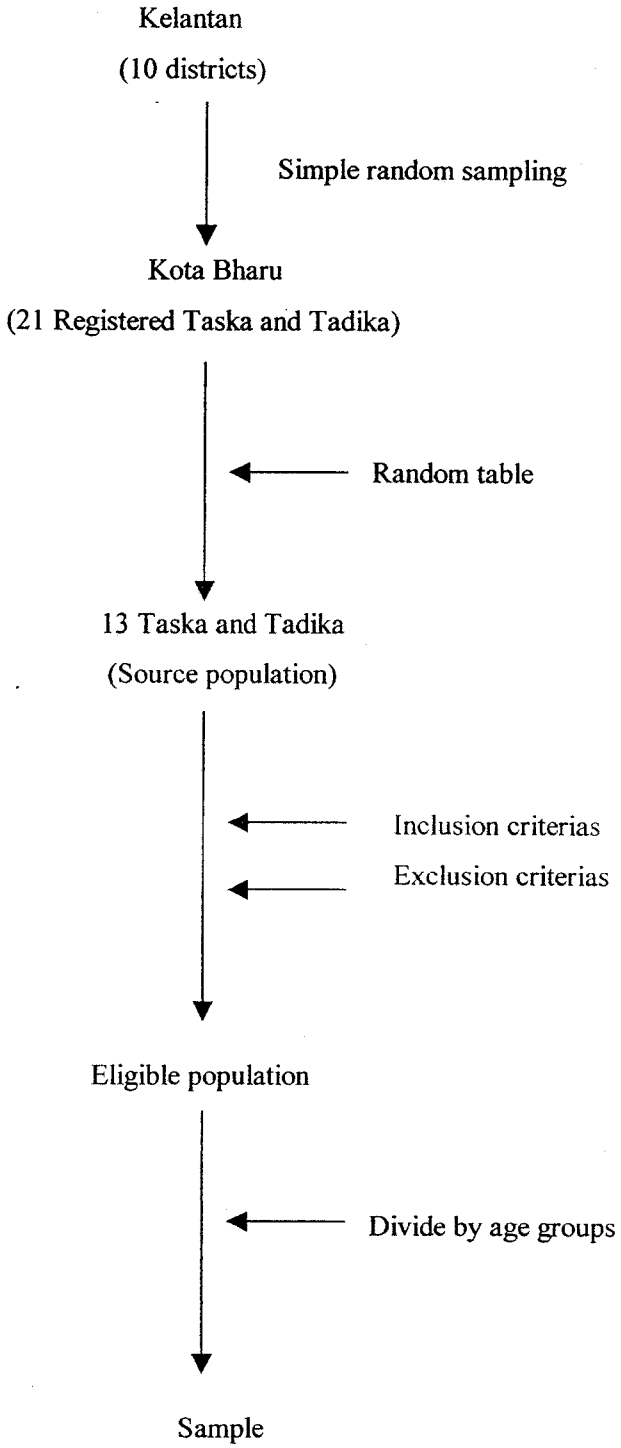
6.2 Source population

Normal Malay Kelantan children aged 2;00 to ~~4;11~~ 5:00 years old who are attending the daycare centers in Kota Bharu, Kelantan.

6.3 Study population

Malay, monolingual Kelantan dialect speaking children aged between 2 to 5 who were attending the daycare centers in Kota Bharu from October 2001 till April 2002. All children showed physical, cognitive and language development typical of their age as judged by the parents, daycare staffs and the author using a formal form (see Appendix 4). Their parents were also the native speaker of Kelantan dialect.

6.4 Sampling method



6.5 Inclusion criteria and exclusion criteria

6.5.1 Monolingual dialect speakers

6.5.2 Parents were the native speakers

6.5.3 Normal physical, cognitive and language development

6.5.4 Normal oral facial speech mechanism

6.6 Stimuli

To date, there is still none standardized screening instrument to assess the phonological development in Bahasa Melayu. Therefore in this study, a structured and formal picture-naming test was designed to elicit spontaneous single-word responses representing all possible initial, middle and final consonants of Malay Kelantan's dialect (see Appendix 5). Two consonants - /h/ and /ʔ/ were not tested in the initial and middle positions because either the word is not representative by picture or the words are not familiar amongst young children. Only 3 consonants tested at final position- /h,ng,ʔ/ because these are the only 3 consonants exist in MKD (Ajid, C.K. 1985).

This phonological assessment designed specifically for Kelantan-speaking children. It is a set of 28 picture cards that was designed to elicit 35 spontaneous one word response containing di and trisyllabic words which represent all possible Initial and Final consonants of Kelantan's dialect (see Appendix 6)

All 35 words depict objects and attributes that are familiar to children. All words used in this assessment were among the earliest vocabulary acquired by children in Kelantan (Wan Zaharah, A.W 2000). These words- 94% nouns, 3% adjective and 3% verb are picturable and were frequently used among children.

A pilot study was done to assess the familiarity of the picture. A few pictures were changed and retest before it can be used.

6.7 Procedure

Each speech sample was recorded on a portable cassette recorder. Samples were collected by the first author, one SLP and assisted by one trained Research Assistant. All researchers were native speakers of this dialect thus familiar with variants of this dialect.

A group of children, consist of 3 to 5 people from the same age group were put together. They first play with the examiners to build rapport before each child was tested individually in a 10 to 20 minutes session. When necessary, other familiar people remained in the session but were told not to help child in anyway. If the child did not name the picture spontaneously, additional cues were given. These include questions, prompt and delayed imitation.

Imitated responses were accepted since a number of studies have shown that there is no significant difference in the result of articulation or phonological process analyses when spontaneous and imitated responses were compared (i.e Bankson & Bernthal, 1982, Bond & Korte, 1983, Pcynter & Bumpas 1977)

In case where a few subjects did not respond to some stimuli, the examiner skipped the pictures and responses were marked as 'no data available'.

6.8 Transcription

The first examiner transcribed the recorded responses using the International Phonetic Analysis system (IPA). See Appendix 7 and 8.

6.9 Outcome management

6.9.1 A phonological inventory chart for Kelantanese dialect speaking children

6.10 Materials needed

6.10.1 Audio tape recorder

6.10.2 Tape recorder

6.10.3 Reinforcement toys

6.10.4 Toys

6.10.5 Picture cards

6.10.6 Forms

6.10.6.1Modified Denver Developmental Screening form

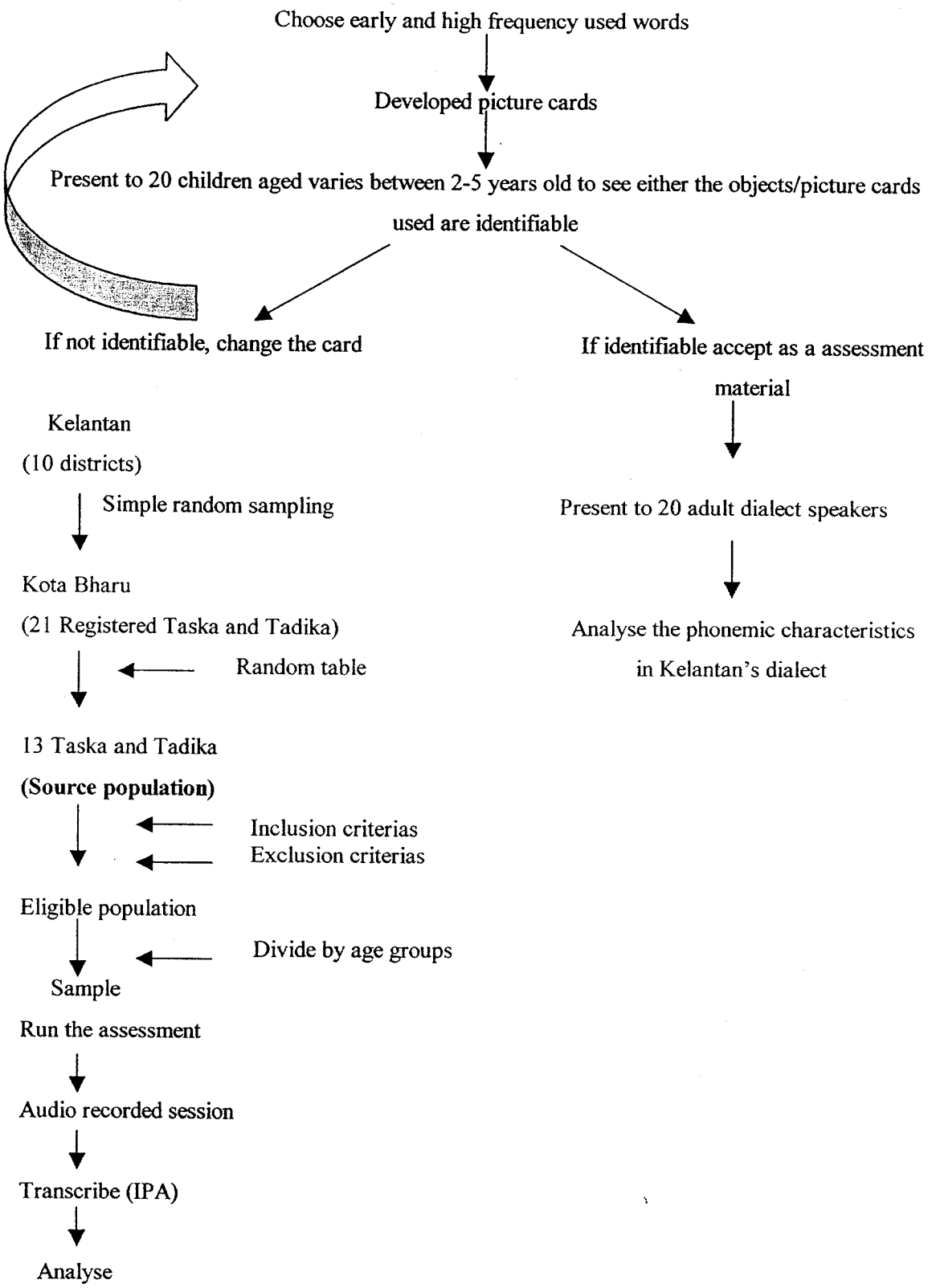
6.10.6.2Personal form

6.10.6.3Transcription form

6.10.7 Stationery

6.10.8 Drink

6.11 Figure 2 Flow chart of research design



6.12 Data entry

Data entry will be done through SPSS Version 10.0 Software.

6.12.1 Descriptive analysis

a) To compare the overall percentage of consonants between age groups

b) To compare the percentage of consonants correctly produced by each age group at initial and medial positions.

c) To compare the overall percentage of phonological processes between age groups

d) To compare the mean age of acquisition of each phoneme with other languages – English, Cantonese and Arabic.

7.0 Results

A total of 100 normal developing Malay Kelantanese children were involved in this study. Out of these subjects, 16% were from the first age group (2;00 – 2;05), 12% from the second age group (2;06 – 2;11), 14% from the third age group (3;00 – 3;05), 22% from the fourth age group (3:06-3;11), 17% from the fifth age group (4;00 – 4:05) and 19% from the sixth age group (4;06 – 4;11).

The proportion of the subjects according to age groups is as illustrated in the Figure 3.

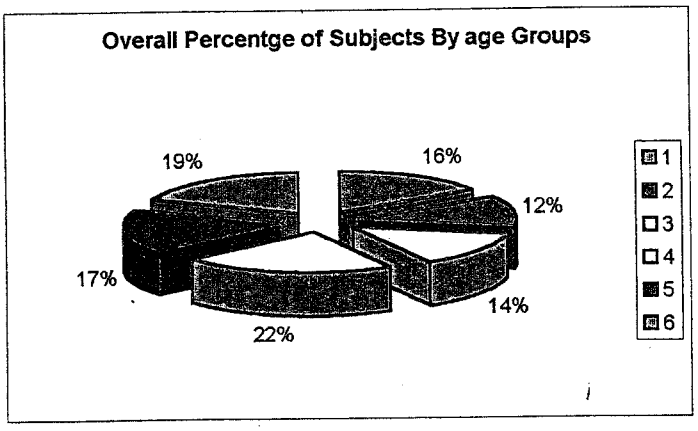


Figure 3 : Percentage of subjects by age groups

A total of 17 phonemes in Malay Kelantanese Dialect (MKD) were tested at the possible initial, medial and final positions in one word picture naming test. The phonemes were as listed in the table 5 below and were grouped based on their manner of articulation.

Manner of articulation	Phonemes
Stops	p, b, t, d, k, g, ?
Nasals	m, n, ng
Lateral	L
Fricatives	r, s, h
Semivowels	w, j
Affricates	tʃ , dʒ

Table 5

7.1 Results of the estimated ages of acquisition in MKD

Phonemes	Estimated age of acquisition
/p/	2.06 – 2.11
/b/	3.00 – 3.05
/t/	2.06 – 2.11
/d/	3.00 – 3.05
/k/	3.06 – 3.11
/g/	3.06 – 3.11
/s/	4.06 – 4.11
/ʧ/	3.06 – 3.11
/m/	2.06 – 2.11
/n/	2.06 – 2.11
/ŋ/	2.06 – 2.11
/l/	3.00 – 3.05
/ʃ/	3.00 – 3.05
/ʤ/	3.00 – 3.05
/w/	2.06 – 2.11
/j/	2.06 – 2.11
/ʔ/	2.06 – 2.11

Table 6 : Estimated age of acquisition of phonemes.

Table 6 illustrates the estimated ages of acquisition of each phoneme tested in MKD. As shown in the table above, the earliest range of age that the subjects started to correctly and consistently produced certain phonemes was at 2:06 to 2:11 and the latest age of acquisition was at 4:06-4:11. From the table, we could clearly see that the process of mastering all of the phonemes in MKD took a long period of time. We also could see that certain speech sounds or phonemes were acquired earlier than the others.

Early (Acquires before age 3:00)	Intermediate (acquired between 3:00 to 4:00 years)	Late (acquired after age 4:00)
p,t,m,n,ng,w,j,ʔ	b,d,k,g,r,l,ʧ,ʤ	S

Table 7 : Three development periods in phonemes acquisition

Table 7 indicates that the acquisition of phonemes in MKD could be divided into three development periods – early, intermediate and late. Early period included those sounds that were acquired before the aged of 3, those that were acquired between 3 and 4 years were classified in the intermediate period and those acquired after the age of 4 were considered late. During the early period in this study it was noted that the subjects had acquired at least 8 or more than half of the total amount of consonants in MKD. During the intermediate period, subjects had mastered another 8 more consonants and only one consonant was mastered at the later stage which is the fricative /s/.

7.2 Overall percentage of consonants produced correctly at initial, medial and final positions by each age group.

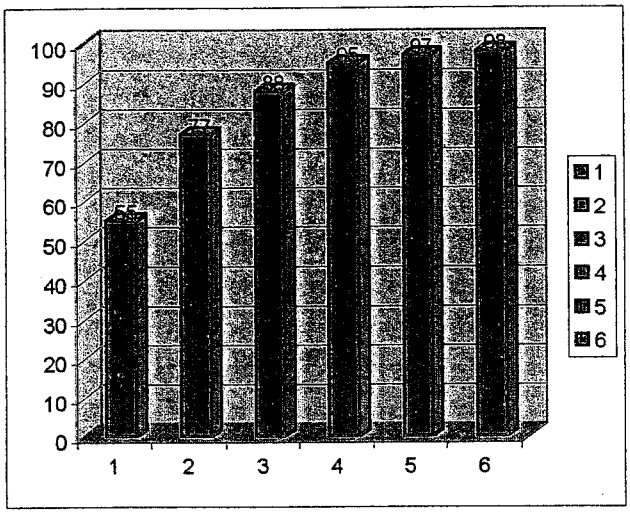


Figure 4 : The overall percentage of correctly produced consonants by each age group.

Figure 4 illustrates the overall percentage of correctly produced consonants by each age group. The value ranging from the lowest percentage which is 55% scored by the first age group to the highest percentage which is 98% scored by the sixth age group. The value increased by age- the older the subjects, the better they were in producing the consonants.

7.2.1 Results of comparison between percentage of correctly produced phonemes at initial and medial positions.

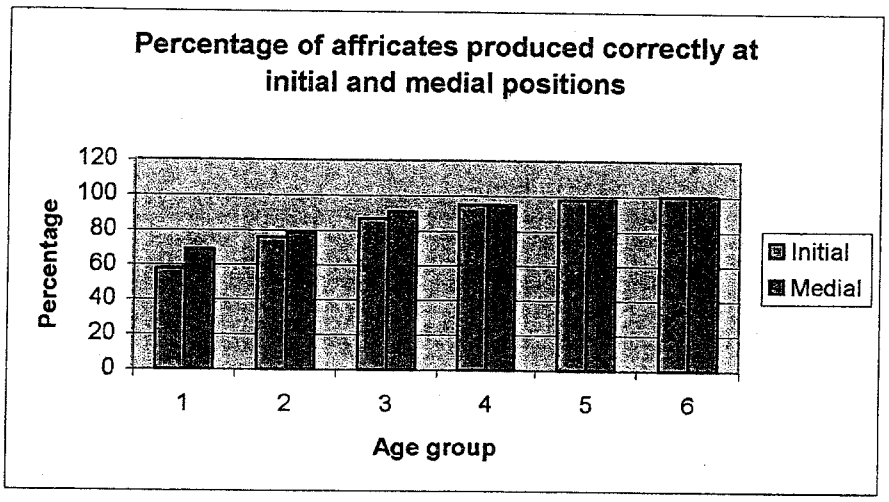


Figure 5 : Percentage of affricates produced correctly at initial and medial positions

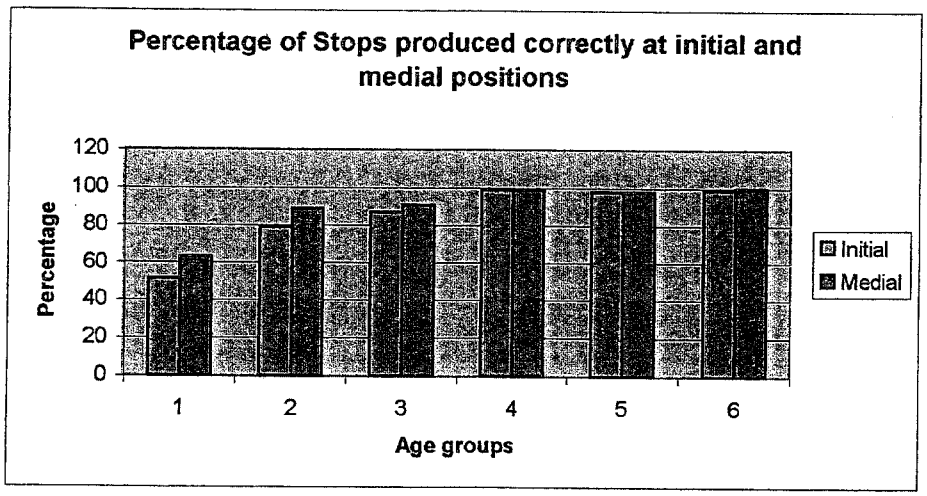


Figure 6 : Percentage of stops produced correctly at initial and medial positions

Figure 5 and Figure 6 show the comparisons between the percentage of correctly produced stops and affricates at the initial and medial positions. Examination from both figures indicate that medial consonants were produced more accurately than those in initial positions in the younger age groups subjects, which are from the group 1, group 2 and group 3.

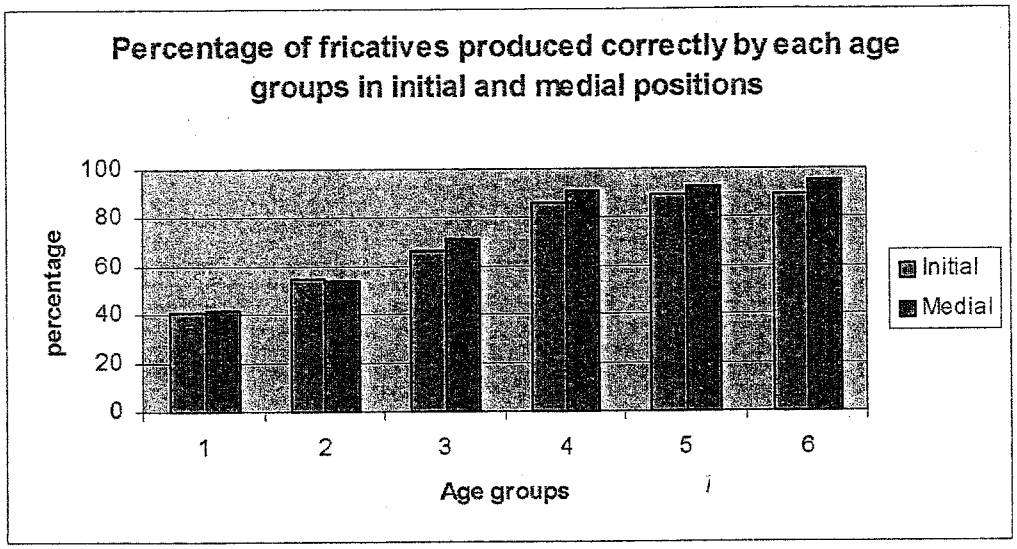


Figure 7 : Percentage of fricatives produced correctly by each age groups in initial and medial positions.

However in Figure 7, it was noted that the production of fricatives at the medial position are more accurate for all age groups.

7.3 Results of sequences of phoneme learning in subjects

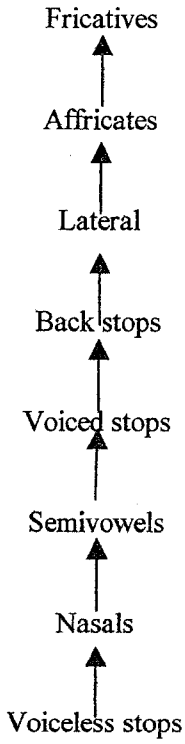


Figure 8 shows the sequences of phoneme learning among subjects who speak MKD. Based on our study, we found that the voiceless stops precede all other speech sounds and the fricative is the last sound to be mastered among our subjects.

7.4 Comparison between acquisition ages of consonants in MKD with Arabic, English and Cantonese.

Sound	MKD	Arabic Acceptable	English	Cantonese
/p/	2.06 – 2.11		3.0	2.0 – 2.6
/b/	3.00 – 3.05	3.00– 3.04	4.0	
/t/	2.06 – 2.11	2.06 – 2.10	3.0	2.0 – 2.6
/d/	3.00 – 3.05	3.00 – 3.04	4.0	
/k/	3.06 – 3.11	2.06 – 2.10	4.0	2.0 – 2.6
/g/	3.06 – 3.11		4.0	
/s/	4.06 – 4.11	5.00 – 5.04	4.6	2.6 – 3.0
/ɣ/	3.06 – 3.11			
/m/	2.06 – 2.11	< 2.00- 2.04	3.0	2.0 – 2.6
/n/	2.06 – 2.11	2.06 – 2.10	3.0	2.0 – 2.6
/ɲ/	2.06 – 2.11			
/l/	3.00 – 3.05	3.06 –3.10	6.0	2.0 –2.6
/ʧ/	3.00 – 3.05		4.6	
/ʤ/	3.00 – 3.05	4.00 – 4.04	7.0	
/w/	2.06 – 2.11	2.06 – 2.10	3.0	2.0 – 2.6
/j/	2.06 – 2.11	2.06 – 2.10	3.6	2.0 – 2.6
/ʔ/	2.06 – 2.11			

Table 8 (i)

7.4.1 Comparison of the acquisition of shared consonants across four languages

	Sound	MKD	Arabic	English	Cantonese
Stop	**t**	**2:6 – 2:11**	**2:6-2:10**	**3.0**	**2:0 – 2:6**
	k	**3.5 – 3:11**	**2.6 – 2.10**	**4.0**	**2.0 – 2.6**
Fricative	**s**	**4.6 – 4.11**	**5.0 –5.4**	**4.6**	**2.6 – 3.0**
Nasals	**m**	**2.6 –2.11**	**<2.0- 2.4**	**3.0**	**2.0 – 2.6**
	n	**2.6 –2.11**	**2.6 – 2.11**	**3.0**	**2.0 –2.6**
Lateral	**l**	**3.0 – 3.5**	**3.6 – 3.10**	**6.0**	**2.0 –2.6**
Semivowels	**w**	**2.6 - 2.11**	**2.6 – 2.10**	**3.0**	**2.0 – 2.6**
	j	**2.6 – 2.11**	**2.6 – 2.10**	**3.6**	**2.0 –2.6**

Table 8(ii)

7.5 Results of phonological processes

Phonological processes	Example	MKD (<20%)
Final consonant deletion	Kipah → kipa	3.6 – 3.11
Initial consonant deletion	Gamba → amba	>4.11
Stopping	Kasut → katu?	>4.11
Consonant harmony	Kucing → cucing	3.6 – 3.11
Affrication	Kasu? → kacu?	3.6 – 3.11
Fronting	Kipah → tipah	4.0 – 4.5
Gliding	Lori → yoyi	3.6 – 3.11
Weak syllable deletion	Seluwa → luwa / suwa	>4.11

Table 9 : Eight most frequent phonological processes made by the subjects

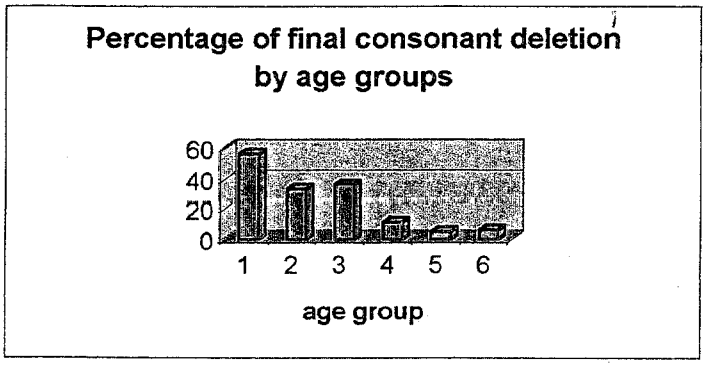


Figure 9

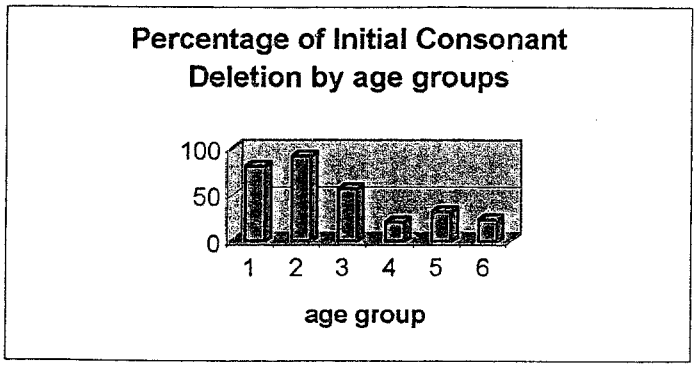


Figure 10

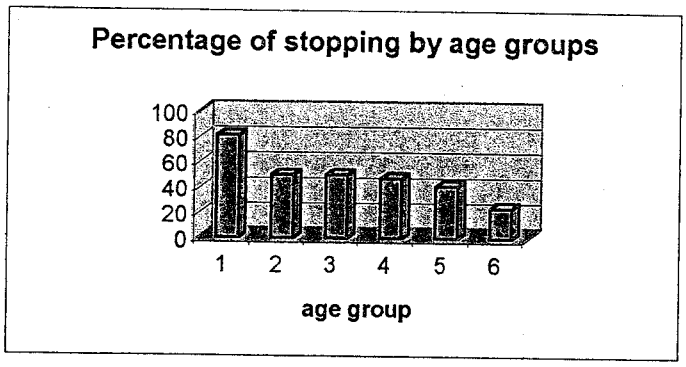


Figure 11

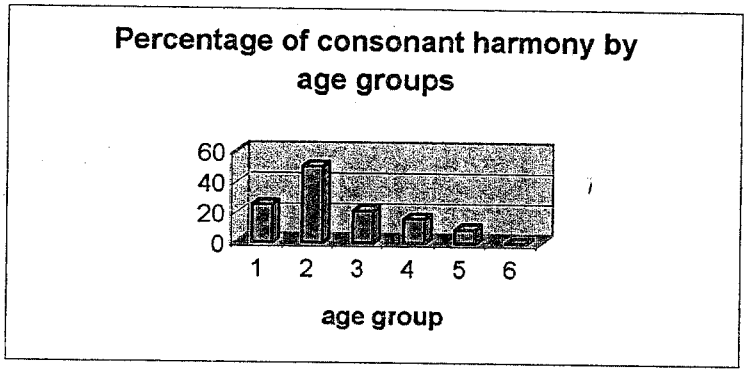


Figure 12

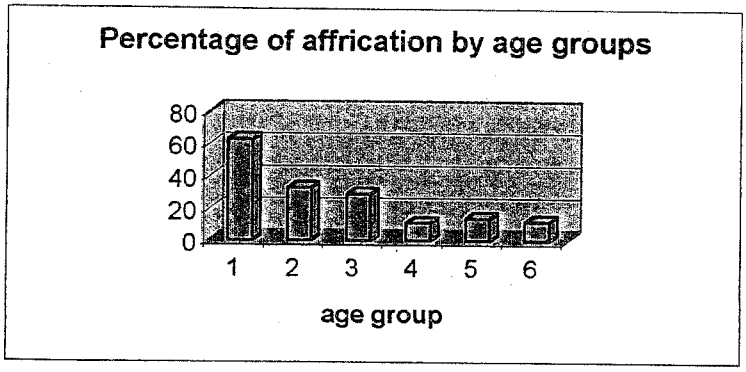


Figure 13

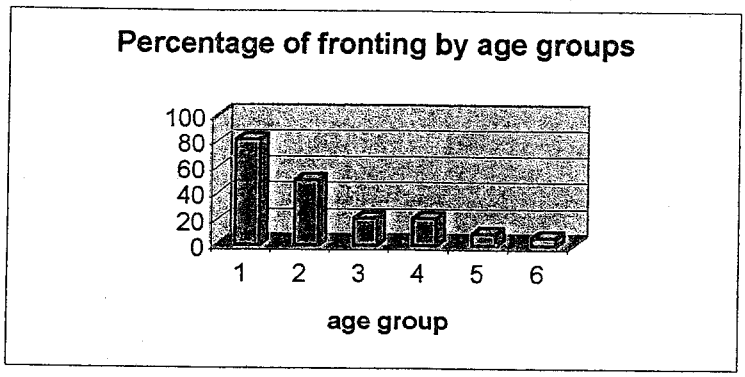


Figure 14

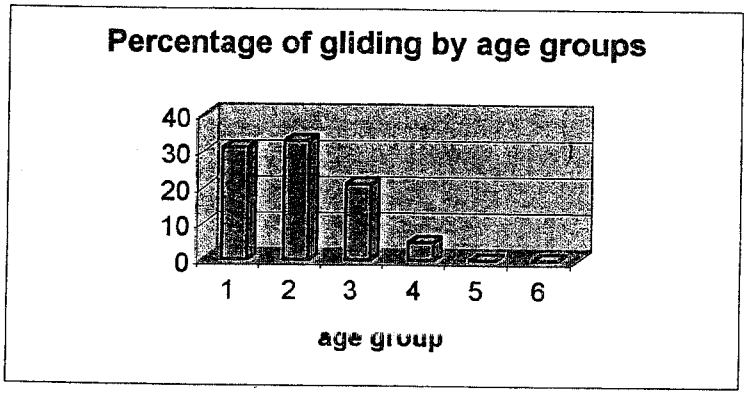


Figure 15

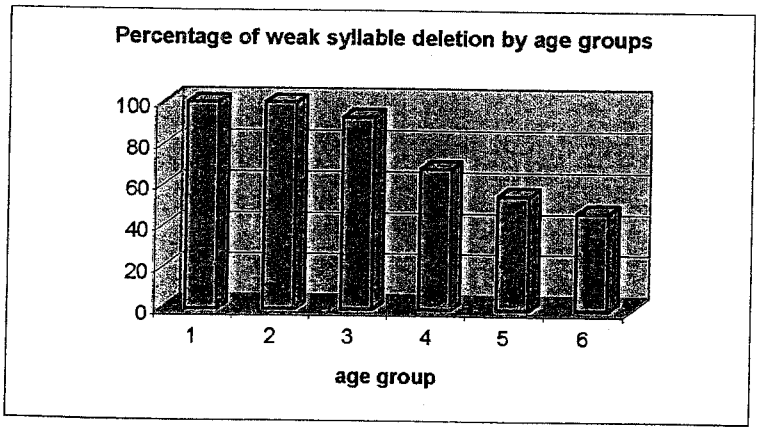


Figure 16

Figure 9 to Figure 16 illustrate the percentage of each phonological processes made by the subjects. We found that they were eight most often phonological processes displayed among our subjects. They were the final consonant deletion, the initial consonant deletion, the consonant harmony, the stopping, the affrication, the fronting, the weak syllable deletion and the gliding. The percentage of each phonological processes generally reduced by age. Younger subjects especially from the first three age groups scored higher percentage compared to the older subjects.

8.0 Discussion

The ages of acquisition of phonemes in Malay Kelantanese Children (MKD)

From Table 6, we can clearly see the estimated ages of acquisition of each consonants/phonemes in MKD that were tested in this study. Table 7 shows the ages of acquisition fell into 3 development periods – early, intermediate and late. Phonemes that were acquired within the range of 2:0 to 2:11 were grouped in early period and those acquired between 3:0 to 3:11 were classified as intermediate and those acquired at the age of 4:00 and above were considered late. It should be noted that these ages of acquisition were defined differently by different researchers and differed from one study to another. For instance, Smit, A.B & Hand, L. (1997) in their study defined early consonants as those that were acquired between the age of 3:0 to 4:0, intermediate consonants were those acquired between 4:0 to 6:0 and late consonants were those mastered at the age of 7:0 and above. Amayreh (1998) in his study defined early period as between 2:0 to 3:10, the intermediate period between 4:0 to 6:4 and late period was after 6:4.

Figure 4 showed the overall percentage of correctly produced consonants, which increased by age. This result tallied with many other similar studies in different languages like English, Spanish, Cantonese and Arabic. The development of speech production took some time to be completed corresponding to the maturity of neuromotor system, articulators and cognitive/perceptual processes. The observation that the mastery of speech occurs over such an extended period suggests that the infants are not endowed with the neuromuscular control for producing the range of sounds in their ambient language and consequently, need to adopt strategies to approximate adult-like speech (Green, J.R. et al 2002).

Our finding is crucial for the speech assessment, screening and remediation program. By knowing the estimated ages of mastering sounds in MKD, the SLP who work with the MKD children will have an idea of how much 'delayed', 'deviate' or 'severe' their patient as compared to their normal peers because they can use the data as a guideline. For the screening purposes, where a SLP need to quickly identify those people who communicate within normal limits and those who may have a communication disorder, this data will also help them. In speech remediation program, knowing the ages of acquisition of phonemes will help the SLP in targeting age appropriate sound for the speech therapy.

The acquisition of phonemes in MKD and the Theory of Universal

Figure 8 shows the sequences of phonemes learning in MKD. From the result we found that the voiceless stops - /p,t/, nasals- /m,n,ng/, semivowels- /w,j/ and glottal- /?/ were the earliest phonemes mastered by our subjects. The second group of phonemes to be acquired were the voiced stops -/b,d/, back stops- /k,g/, lateral- /l/, fricative /r/ and affricates / t , d / while the last phoneme to be mastered was the fricative /s/. Fricatives like / / was acquired at the intermediate period and /s/ was acquired at the later period.

This result support Jakobson's (1968) Universal Theory that the acquisition of phonemes in all language follows similar patterns when stops were generally acquired before fricatives. The voiceless cognates tended to precede the voiced cognates such as /p/ > /b/ and /t/ > /d/ and it was noted that nasal consonants /m,n,ng/ headed the unvoiced stops /p,t/. These findings also have supported Jakobson's Universal Theory.

Because there is no other study of Malay Kelantanese Dialect phonological acquisition, it is not possible to determine whether the findings of this study are consistent with those reported by others. However it is interesting to note that Mohd Salleh, M. (1990) who studied the phonological development in four Malay children who speak Johor dialect reported that the two year old and 3 year old subjects have acquired all phonemes except for fricative /s/ and by the age 4, all phonemes were acquired. While Siti Ramlah, S. (1992) studied the phonological development in 12 Malay children ages 2 to 6 years who speak official Malay language reported that one year old subject have acquired plosives, affricates, nasals and semivowels but not the liquid and fricatives where as the 2 year old subjects were reported to have mastered all the primary phonemes. It is important to note that both studies did not report of any structured test use, percentages of accurate production and the distribution of phoneme in words.

The clinical implication from these sequences of phonemes learning is vital for the speech remediation program. A familiar guideline for treatment target selection is to target those processes that occur optionally and affect sounds that are developmentally age-appropriate (Dyson & Robinson, 1987).

The accuracy of consonants by position in the targeted words

Figure 5, 6 and 7 show that medial consonants were more accurately produced especially for the younger age groups of subjects. This finding has three important implications. First, the medial position seems to be important and should always be included in phonological tests of MKD. Second, the performance of a disordered child on consonants in the medial position may be an important indication of the severity of the articulation problem. For instance, correct production of target consonant at the medial position but error on initial position might indicate that the child is delayed but within normal developmental sequence. Third, treatment of articulation disorder might want to target sound at the medial position first before proceed to initial or final position.

The accuracy of the consonants by word position might be due to stress pattern. The nature of stress is simple- everyone would agree that the second syllable of words like '**bunga**', '**api**' and '**lampu**' is stressed. Children use stress to indicate meaning of the words. Parents also use stress pattern when they speak to their children especially younger ones. For example, a mother point to a vase of flower and say 'tengok tu, bu**nga**.. cantiknya bu**nga**..' The child may delete unstressed syllable to produce for example ***way*** for ***away*** (Oller 1974). Most of the words tested in this study are disyllabic words therefore it might be possible that stress might have influenced this result.

The comparison of the ages of acquisitions of phonemes among children who speak MKD, English, Arabic and Cantonese

Table 8(i) show the comparison of the acquisition ages in MKD, Arabic, English and Cantonese while table 8(ii) show the comparison of shared consonants across four languages. From table 8 (I), the age range for the completion of the phonemes in MKD was 2:6 to 4:11. This age range relatively faster than the age range for the English children (3:0 to 7:0) and Arabic children (<2:0 to 5.4). As compared to Cantonese speaking children, they were the fastest to complete their phonemes acquisition with the estimated age range between 2:0 to 3:0.

The consonant inventory of MKD differed in comparison with English, Arabic and Cantonese. Compared to English, MKD only involved 17 phonemes- 7 stops, 2 fricatives, 2 affricates, 3 nasals, 2 glides, 1 liquid. Where as English language has 25 consonants- 6 stops, 2 affricates, 9 fricatives, 4 nasals, 2 glides and 1 liquid. Arabic language has a total of 28 phonemes with 8 stops, 13 fricatives, 1 affricate, 2 nasals, 2 liquids and 2 glides. Compared to Cantonese language, it has 19 consonants- 8 stops, 3 nasals, 3 fricatives, 2 affricates, 1 liquid and 2 glides. Only eight consonants were shared together in all four languages- /t, k, s, m, n, l, w, j/.

MKD and Arabic appeared to be close in their ages of acquisition of stops. Stops were acquired the earliest in Cantonese followed by the Arabic, MKD and English. Fricatives appeared to be acquired later than any other phonemes. English and Arabic shared the greatest number of fricatives. Fricatives were acquired earliest in Cantonese, followed by English, MKD and Arabic. Arabic and Cantonese children appeared to acquire nasals the earliest followed by MKD and English. Cantonese consistently has the earliest in their phonological acquisition followed by Arabic , MKD and lastly English.

Relatively we would say that, as compared to English and Arabic children, our subjects completed their phonetic inventory earlier, which is at the age of 4:11. These differences in the ages of acquisition could be contributed by a few factors. The first factor could be depended on the total amount of phonemes that were studied. My opinion is that, if the language has lesser phonemes, shorter time is needed to master all the sounds in that language. For example, our study involved only 17 phonemes, as compared to Amayreh (1998) who studied 28 phonemes in Arabic language and Smit, A.B & Hand, L. (1997) studied the acquisition of 25 English phonemes. Findings from the study done by So, L.K.H., & Dodd, B.J. (1995) in the acquisition of

phonology in Cantonese speaking children could have support my opinion. In their study they found that Cantonese speaking children completed to mastered all 19 consonants at the range of 2:0 to 3:6.

Secondly it could be due to the amount of fricatives in the language that were studied. Since fricative is one of the most difficult phoneme to produce, I would suggest that any language, which has more numbers of fricatives, the speakers of that language might took longer time to complete their phonetic inventory. For example, English has nine fricatives and the normal English speaking children mastered the fricative /z/ at the age of 7, Arabic language which has 13 fricatives took until 6:6 to master fricative /z/ but Cantonese speaking children who only has 3 fricatives in their language took about the age of 3:0 to 3:6 to mastered all three fricatives.

Thirdly, the differences in the manner of production could also contribute to these differences. For example in English we have aspirated /p/ but not in MKD. And the last reason that I could think of is the distribution of consonants in words. For example, in MKD the /p/ only exist at the initial and medial positions but in English we have /p/ not only in initial and medial but also at the final positions.

The most common phonological processes made by normally developing children

As referred to the Figure 9 to figure 15, there were eight most frequent phonological processes made by the subjects. The processes were the final consonant deletion, stopping, initial syllable deletion, consonant harmony, affrication, fronting and gliding. It was obvious that the phonological processes reduced by age which means that the older the subjects, the lesser the processes made. But it could be noted that in some phonological processes like consonant harmony, gliding, initial consonant deletion subjects in group 2 displayed higher percentage compared to the subjects in group 1.

The reason could be because of subjects in group 2 were more responsive than those in group 1. They were more willing to speak with the examiners and not afraid of making mistakes. Subjects in group 1 were quiet shameful and sometimes not responding to the examiners and it was quite hard to elicit spontaneous respond from some of them.

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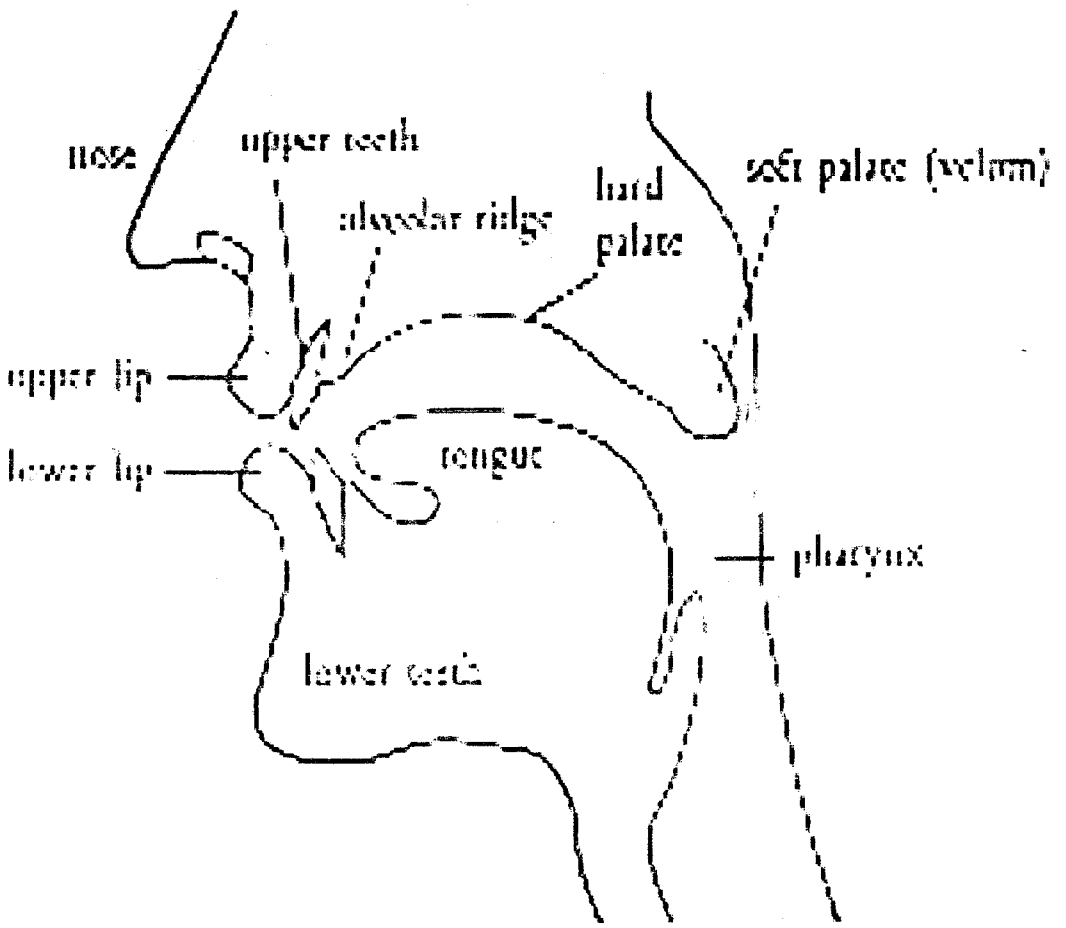
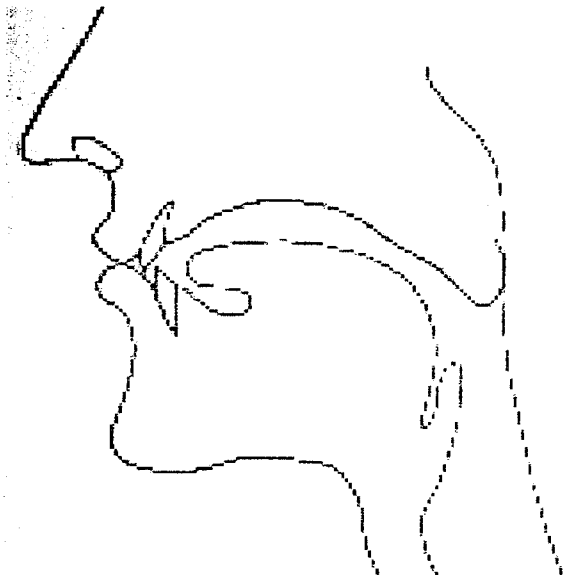
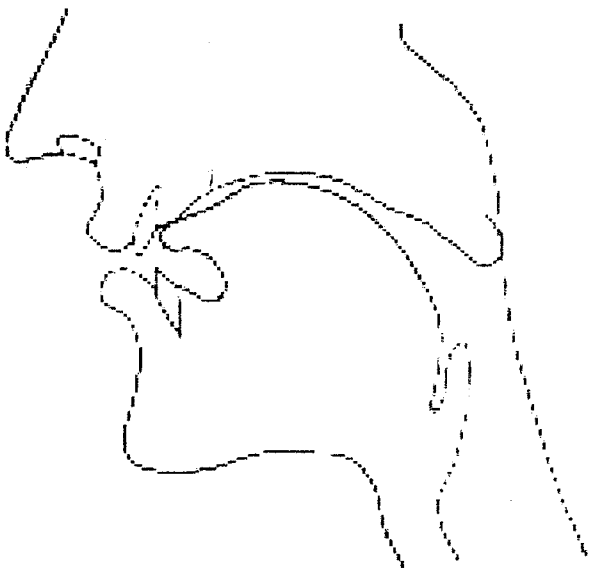
The Articulators



Place of articulators

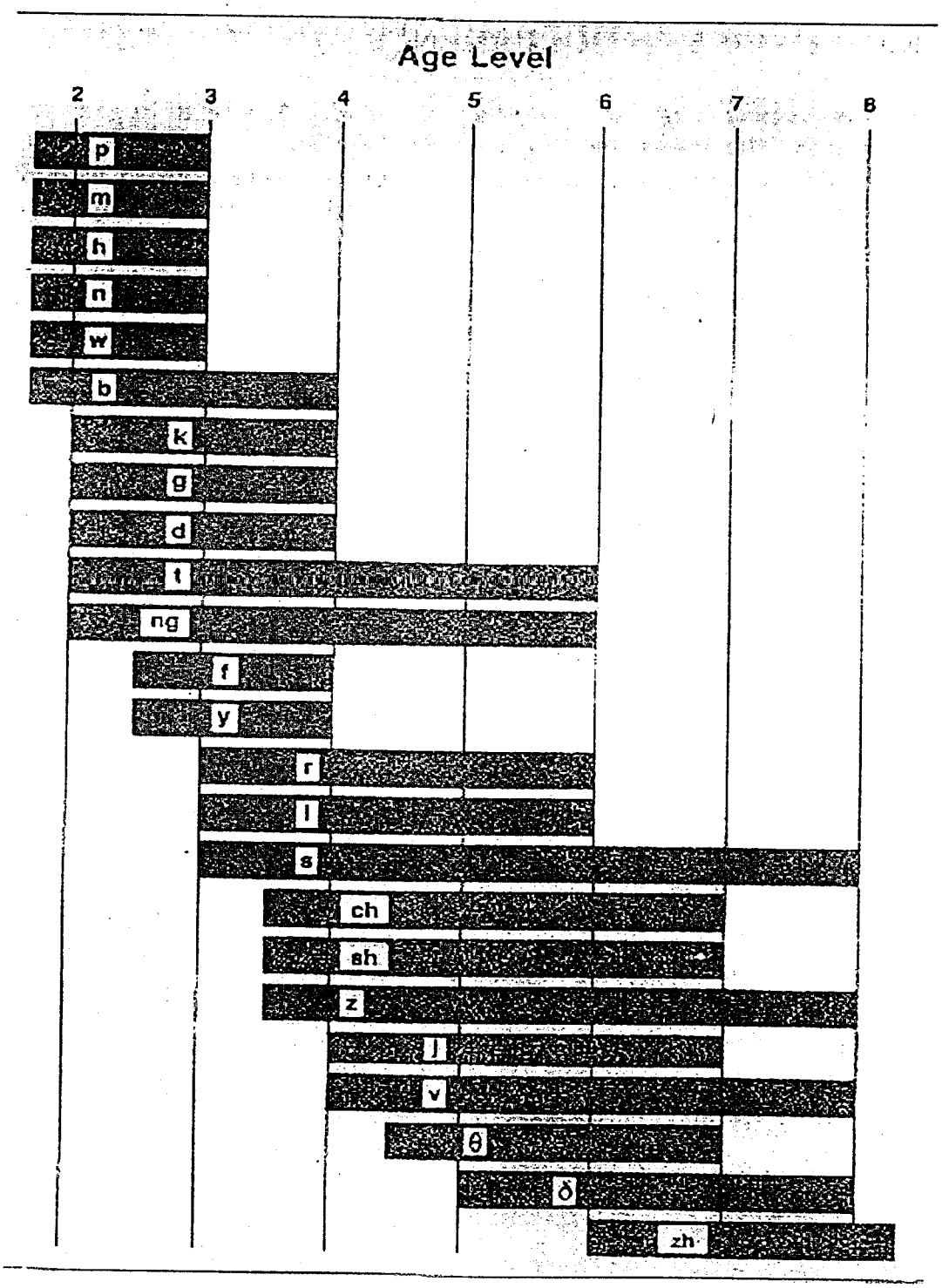


Bilabial articulation : /p, b, /



Alveolar articulation : /t,d/

An example of age ranges data of normal consonants development (Templin 1957)



MAKLUMAT PERIBADI BAPA

1. Nama :
2. No. IC baru :
3. Tempat dibesarkan :
4. Pekerjaan bapa :
5. Taraf pendidikan : Ijazah lanjutan/ijazah/diploma/STPM/SPM
6. Pendapatan keluarga : a) RM 5000 ke atas
   b) RM 3000-RM 4999
   c) RM 1000-RM 2999
   d) RM 500-RM 1999
   e) kurang RM 500

MAKLUMAT PERIBADI IBU

1. Nama :
2. No. IC baru :
3. Tempat dibesarkan :
4. Pekerjaan ibu :
5. Taraf pendidikan Ijazah lanjutan/ijazah/diploma/STPM/SPM

MAKLUMAT PERIBADI ANAK

1. Nama
2. Jantina :
3. Tarikh lahir :
4. Kumpulan umur :
5. Tempat dilahirkan :
6. Tempat dibesarkan :
7. Anak ke berapa :
8. Jumlah adik-beradik :

PENILAIAN OROMOTOR

1. Air liur masih meleleh keluar Y /T
2. Boleh mengunyah makanan keras : nasi, daging Y /T
3. Lidah selalu terkeluar Y /T
4. Boleh menjilat aiskrim Y /T
5. Suara sengau / 'ngidung' Y /T
6. Bibir tertutup bila tidak bercakap Y /T
7. Ada gigi depan @ tidak rongak Y /T

2:00 sehingga 2:06

1. Boleh pakai kasut sendiri ☐
2. Basuh dan keringkan tangan ☐
3. Boleh menyonteng ☐
4. Main seorang diri dengan anak patung/robot untuk satu tempoh yang agak lama ☐
5. Boleh memanjat anak tangga ☐
6. Meniru buat garisan lurus ☐
7. Bercakap dua patah perkataan seperti 'nak makan' ☐
8. Menamakan gambar yang dilihat ☐
9. Ikut arahan ☐
10. Tendang bola ke depan ☐
11. Boleh beritahu nama sendiri ☐
12. Boleh guna perkataan 'banyak' dengan betul ☐

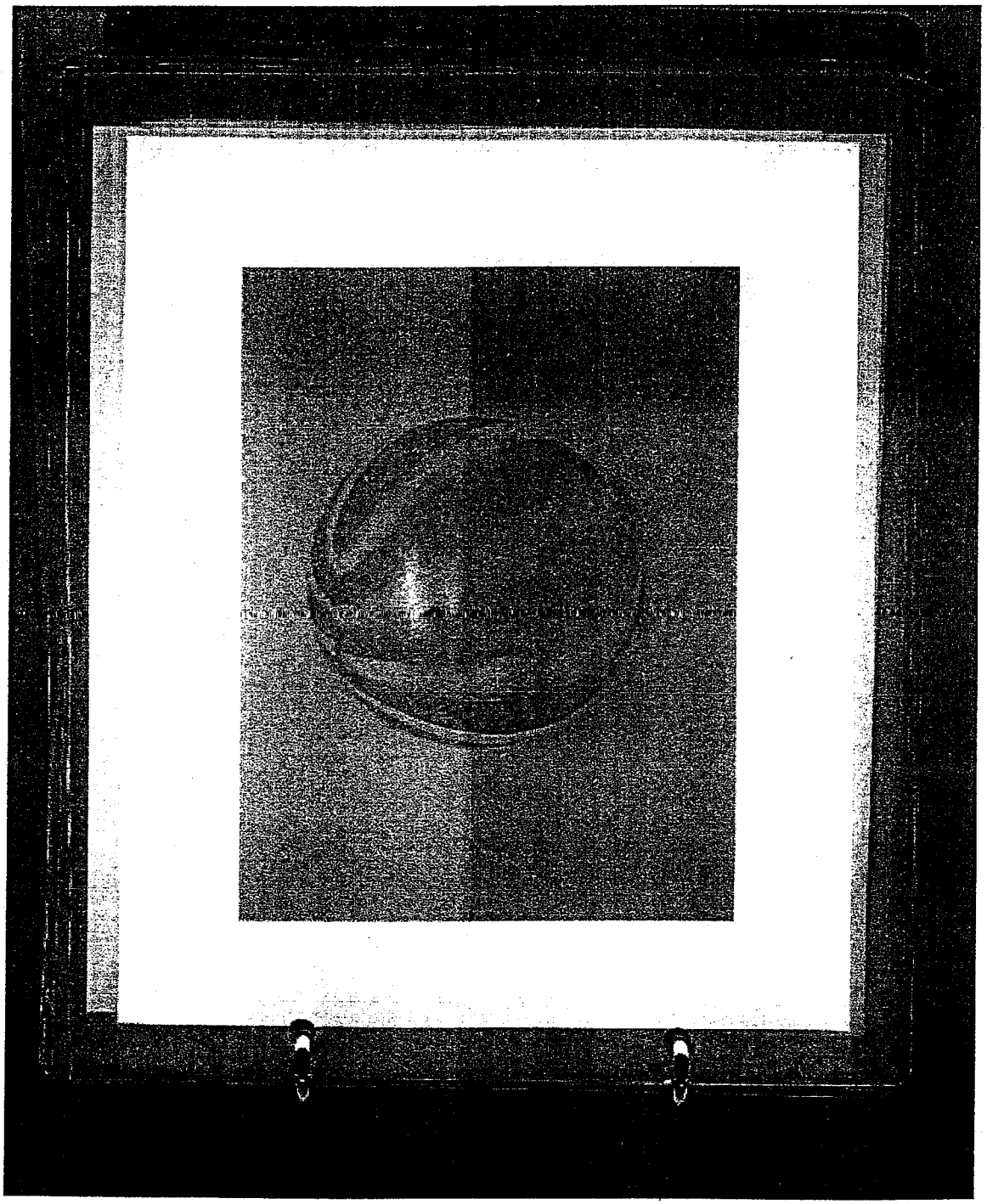
2:06 sehingga 3:00

1. Pakai baju sendiri ☐
2. Basuh dan keringkan tangan ☐
3. Meniru buat bulatan ☐
4. Susun 8 kiub menegak ☐
5. Meniru buat garisan lurus ☐
6. Lompat setempat ☐
7. Naik basikal roda tiga ☐

3:00 sehingga 3;06

1. Boleh berlari dengan laju ☐
2. Naik basikal roda tiga ☐
3. Bermain permainan dgn undang-undang ☐
4. Meniru buat bentuk bulatan ☐
5. Boleh guna perkataan 'atas' dan 'bawah' ☐
6. Bercakap dalam ayat : sambung 4 patah perkataan ☐
7. Guna perkataan 'banyak' dan 'sikit' ☐
8. Bagitahu nama penuh ☐
9. Seimbangkan badan dengan sebelah kaki – 1 saat ☐
10. Boleh pergi tandas seorang diri ☐

Appendix 5



SENARAI PERKATAAN BAHASA MELAYU

1. botol	2. ayam	3. kucing	4. cicak
5. bola	6. buku	7. baju	8. seluar
9. duit	10. banyak	11. jam	12. meja
13. nasi	14. roti	15. biskut	16. telur
17. kasut	18. kipas	19. lampu	20. wau
21. gambar	22. bedak	23. lori	24. gigi
25. nganga	26. rumah	27. pokok	28. daun
29. lilin	30. api	31. selipar	32. sikat
33. pisau	34. lembu	35. satu	

Appendix 7

Phonological Analysis

Phoneme	Initial	Medial	Final
p			
b			
t			
d			
k			
g			
m			
n			
ŋ			
s			
ɣ			
h			
tʃ			
dʒ			
l			
w			
j			

The International Phonetic Alphabets