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Phonological Acquisition Among Malaysian English Child Speakers Of Indian Descent

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ABSTRACT

This preliminary study aims to provide an initial description of phonological acquisition among Malaysian Children of Indian descent aged two to six years. The description of the consonantal phonemic inventory as well as various Phonological processes evidenced by subjects is also reported. The mothers' phonemic inventory was obtained as the representation of the children's most active environmental linguistic input. Speech samples of the mothers as well as the subjects were obtained from a single word test and narrative test. The speech sample was recorded and transcribed using the International Phonetic Alphabet. The results of the tests revealed a significant correspondence between the subjects' phonemic inventory and their mothers' except for the following phonemes: /ð/ , /θ/ , /v/ and /w/. Both mothers and subjects demonstrated free variation for the production of /v/ and /w/. The mothers displayed a range of 21-23 phonemes in their inventories whereas the subjects displayed a range of 17-21 phonemes. The age acquisition for some phonemes, namely the affricates which was evidenced by subject aged 2;4 were noted to be earlier than that of subjects in past studies. Rapid phonological development was evidenced at the age of 2;4- 3;7.

Key words : phonological development, Malaysian English phonology , Malaysian children's articulation.

ABSTRAK

Kajian rintis ini bertujuan untuk memberikan satu huraian pemerolehan fonologi di kalangan kanak-kanak berketurunan India berumur antara dua hingga enam tahun yang berbahasa Inggeris Malaysia. Huraian tentang set inventori fonem konsonan serta proses-proses fonologi yang wujud pada subjek-subjek turut dipaparkan. Set inventori fonem ibu digunakan sebagai faktor rangsangan/input linguistik persekitaran subjek. Sampel pertuturan subjek dan ibu diperolehi melalui ujian kata tunggal dan ujian bercerita. Sampel pertuturan yang diperolehi ditranskripsikan dengan menggunakan Sistem Fonetik Antarabangsa (International Phonetic Alphabet). Hasil kajian memperlihatkan inventori fonem subjek kanak-kanak yang condong kepada inventori

fonem ibu mereka kecuali penghasilan /ð/, /θ/, /v/ dan /w/. Kesemua ibu dan kanak-kanak didapati menggunakan /v/ dan /w/ secara variasi bebas. Inventori fonem ibu terdiri daripada 21-23 fonem manakala inventori fonem kanak-kanak terdiri daripada 17-21 fonem. Umur pemerolehan sesetengah fonem didapati berlaku lebih awal daripada kajian-kajian yang lepas, contohnya kelas bunyi afrikat yang wujud pada subjek berumur 2;4 dan ke atas berbanding dengan umur 3;6 dan ke atas dalam kajian-kajian yang lepas. Didapati juga perkembangan fonologi berlaku dengan pesat antara umur 2;4-3;7.

Kata kunci : Perkembangan fonologi, Fonologi Bahasa Inggeris Malaysia, Artikulasi kanak-kanak Malaysia.

INTRODUCTION

Studies of children's phonology have been done extensively in foreign countries. Some of these date years back as in the works of Poole (1934), Templin (1957) and Grunwell (1981). Although some differences have been documented, the general phonological development is clearly evidenced. For example, the plosive sound /p/ is obtained before the fricative /s/ (Grunwell 1981).

These findings are crucial as the studies have helped parents, teachers and speech-language pathologists identify developmental phonological acquisition of sounds, hence, identifying speech difficulties through access to these developmental normative data.

STATEMENT OF PROBLEM

Malaysian speech language pathologists have long been using foreign normative data for diagnosis and planning of intervention, such as the norms reported by Grunwell (1981). Foreign normative data are not suitable to the local population as sound acquisition is influenced by factors such as linguistic exposure differences as a result of a community that comprises various ethnic groups, cultures and languages. Bernthal & Bankson (1998) stated that each language has a different phonemic repertoire. An English speaker who is influenced by Tamil will present with a system that is different from that of an individual who is influenced by Mandarin. These influences can clearly be seen in one's production of sounds, speech-language structures and arrangement. The affects of this influence validates the need to obtain normative data for children in Malaysia and this region.

Studies such as these are a rarity. Most efforts in depiction of the Malaysian English (ME hereafter) system are focussed on language usage emphasizing syntax and morphological data among adult speakers (Platt 1983, Platt & Weber 1980, Chitravelu 1985, Brown 1988, Soo 1990, Tham 1992 and Gupta 1994). Among the few studies available, only Ng (unpublished, 1999) looked at the phonological acquisition of children, depicting their developmental phonological processes. However, none of these studies were sufficiently comprehensive to depict the sound acquisition system of ME speaking children, particularly that of the Indians.

The present study focussed on sound acquisition of ME in children of Indian descent, as it is much needed as more and more Indian children in Malaysia have English as their first language or mother tongue instead of Tamil, hence validating the need for normative data.

This descriptive study provides an overview of early developmental sound acquisition of phonemes of ME speaking children of Indian descent and describes existing phonological processes.

SCOPE OF STUDY

The subjects in this study were of Malaysian Indian descent only with English as their first language. Malaysian English, in this study is defined as English spoken by Malaysians. Gupta (1994) explained that users of ME have long been described to comprise a wide range of users, from those who are able to use the language minimally for social needs to those who are proficient speakers.

METHODOLOGY

RESEARCH DESIGN

This study was a cross-sectional, descriptive study. A Single Word & Narrative test (Thomas Joseph 2000, unpublished) was designed to elicit target words for phoneme sampling in this research. The efficacy of this form of sampling was reported in Stoel-Gammon & Stone (1991). Single Word testing is found to have good validity, is extensive and effective (Evans & Craig 1992). Morrison & Shriberg (1992) reported the importance of narrative testing as single word use does not display a child's ability to integrate and generalise these phonemes into conversational speech. They found that developing phonemes were present at the single word level only meanwhile established phonemes were used confidently in conversational speech.

SUBJECTS

In this study, proficient users have been targeted as subjects. These children use English as their dominant language (with usage of more than 80% of the time) and are exposed to proficient and daily use of the language by their parents. The following criteria were adhered to in subject selection :

a) Age range must meet the mean age for each age group (i.e. the four year old subject must be between ages 4; 4 - 4; 8 only).

b) All subjects and their mothers' must be Malaysians.

c) Indian descent.

d) Exposed to the use of English as a dominant language (80% or more in daily use).

e) Does not present with any speech and language difficulties, psychological /neurological problems, hearing or/ and visual difficulties.

f) Not related to subjects in pilot study.

TABLE 1 Age of Research Subjects.

Age	Pilot Subject	Adult subject	Subject
2 years	2;7	Mother	2;4
3 years	3;10	Mother	3;6
4 years	4;11	Mother	4;8
5 years	5;1	Mother	5;4
6 years	6;2	Mother	6;6

Data was gathered from a group of 5 subjects who represented a target population to represent each age group (i.e. 2, 3, 4, 5 and 6 years) who use English as their main language of communication. Adult subjects (i.e their mothers) were chosen to represent the linguistic exposure of the children in this study.

A pilot test consisting of 5 children from the same age ranges was conducted to validate the articulation test that was designed to elicit the target words. Inappropriate/ ambiguous test pictures were changed as needed after the pilot test. Speech sampling of both mother and child was conducted in the homes of the subjects.

TEST/ SAMPLING INSTRUMENT

Due to lack of availability of studies researching ME phonemic inventories, the phonemic repertoire depicted in the South Tyneside Assessment of Phonology (STAP) (Armstrong & Ainley 1990) as well as featured by Crystal (1981) and Roach (1994) was used to *design* word targets for the Single Word & Narrative Articulation Test. However, production analysis was a comparison of mother and child subject productions and not a comparison to the inventories mentioned above).

Sampling was taken at 2 levels: the single word level and at the conversational level (obtained through narrative story testing). Data was audio-recorded and transcribed using the International Phonetic Alphabet System (IPA) and then analysed.

a) Single Word Articulation Test

This test was made up of 24 picture cards sized 18.7 X 13.7cm with 57 target words consisting of each phoneme at the word-initial, word-medial & word-final position. Target words were chosen carefully, fulfilling criteria of word frequency among young children, tangible in presentation and culturally appropriate. Crary (1983) found that a 50-word sample was enough to display the characteristics of a child's daily phonological system.

PHOTO 1 Single word articulation test

b) Narrative testing

Conversational speech sampling was taken through this self-designed narrative test entitled "Ziggy the Blue Elephant". This test consisted 51 target words with phonemes represented at the word-initial, word-medial & word-final positions. Target phonemes were present at least once in all possibly occurring positions of the word. The child was told the story and then encouraged to retell the story.

PHOTO 2 Narrative story test - "Ziggy the Blue Elephant"

Careful and systematic target word elicitation cues were adhered to in sampling according to a hierarchy of cueing. This took the following structure: spontaneous production → semantic cueing → false alternatives → direct imitation (if all fails).

METHOD OF DATA ANALYSIS

Each speech sample was transcribed phonetically using the International Phonetic Alphabet System (IPA) and was peer-reviewed to ensure reliability whenever required. Each adult's sample was transcribed first as it represented a control phonemic sample of the children in this study. Next, each subject's production was transcribed and compared to his/her mother's production. This is in line with the theory that pre-schoolers acquire both speech and language from the adults in their immediate surrounding.

Intra-sample productions of the Single Word and Narrative Test were compared for the adults and subjects. Each phoneme was recorded present when produced at least once. A phoneme present once indicates that it was already within the innate representation of the speaker. This assumption was also made for the analysis of the phonological processes. If the production of the subject and the mother was identical,

they were not classified as a phonological process for the child as they were not considered to be extraordinary.

RESULTS

The test instrumentation was highly successful with subjects achieving 100% of all target words for the single word test, except subject 2;4 who achieved 90% of the targets. For the narrative tests, all subjects achieved between 62-82% of target words whilst the subject aged 2;4 achieved about 47% of targets.

ANALYSIS OF FINDINGS

(a) The Phonemic Inventory

It was found that the mothers presented with a range of 21-23 phonemes in their inventory. Phoneme /ʧ/ was not present in any of their inventories whereas the phonemes /θ/ and / ð/ were present for some of them.

The child's phonemic inventory had a maximum of 21 phonemes with the phonemes. The phonemes /ʧ/, /θ/ and / ð/ were missing in all of them. Subject aged 3;7 had only 19 phonemes with phonemes /ʧ/, /θ/ , / ð/ , /h/ and /w/ not acquired. Subject aged 2;4 had only 17 phonemes only with phonemes /ʧ/, /θ/, /ð/, /w/, /r/, /s/ and /z/ not acquired. Data revealed the presence of both affricates /tʃ/ and /dʧ/ in the phonemic inventory since age 2;4.

(b) Phonological Profiling

Phoneme acquisition is closely related to phonological processes and hence, was depicted in detail in the study. The phonological processes were divided into two functional categories according to the classification drawn by Grunwell (1981), namely structural modification and systemic modification. Structural modification refers to a process whereby the production of a word is made easy through omission or assimilation of particular phonemes. For example, the word /sta/ (star) is structurally modified through omission of /s/ becoming /ta/. Systemic Modification refers to free segmental changes of a word. For example, the phoneme /r/ is replaced by the phoneme /w/ through the gliding process producing /ziro/ (zero) as /ziwo/. The table below depicts just one example of each process evidenced by each subject of the age group range.

(c) Production of /w/ and /v/

In this study, extra attention was placed upon the manner of production of these phonemes through observation of production. In theory, the phoneme /v/ is a labio-dental voiced fricative with spread lips whereas /w/ is a semi-vowel that has clear lip-rounding (Nor Hashimah 1998). The present study revealed that /w/ and /v/ were produced interchangeably at any given position of the word (initial, medial & final) for all child and adult speakers e.g. 'flower' produced as /flavə/ or / flawə/ ; 'van' produced as /vɛn/ or /wɛn/.

DISCUSSION

The review of data collection of child subjects demonstrated similar findings for single word and narrative speech. The adults however, demonstrated inconsistent responses in both tests. This was seen in adult productions for /ð/ and /θ/ at the single word level but /t/ and /d/ in narrative and conversational speech. This could be because the adults were psychologically aware of the test material when single words were being elicited and made efforts to produce standard English pronunciation but did not generalise it in conversational samples as it was not innate to them. Morrison & Shriberg (1992) have stated that if in doubt of one's phonemic representation, spontaneous speech is the best measure to detail one's phonemic inventory.

ADULT'S PHONEMIC INVENTORY

All adults demonstrated an inventory of between 21-23 phonemes, with the phoneme /ʒ/ not present in any of the speakers consistently. /ʒ/ was consistently replaced by /ʃ/ i.e 'treasure' pronounced as /trɛʃə/. This is similar to findings by Bansal (1969) who found that the phoneme /ʒ/ was not used by Indian speakers of English. The replacement production of /ʒ/ to /ʃ/ of this phoneme is likely influenced by the orthography of the word.

The phoneme /ð/ and /θ/ were produced as /t/ and /d/ respectively in all positions. This did not change word meaning and had no effect on the intelligibility.

The findings reveal that the adult phonemic inventory of ME differs from that of British Standard English. History relates that formal texts used in our country are those which were introduced during British colonisation times (Asmah 1981) and were introduced since the early days of the colonisation of Pulau Pinang by Sir Francis Light in the year 1786 and thence, to other states (Platt & Weber 1980; Platt 1983). As supported by many other researchers, the Malaysian English spoken here has and will continue to evolve as its own language, both phonetically and in syntax due to the presence, active use and exposure to other languages.

TABLE 2 Phonological Processes According to Age.

AGE	PHONOLOGICAL PROCESS	EXAMPLE OF PRODUCTION
2;4	I Structural Modifications	
	• Consonant cluster reduction	/skaɪ/ → /kaɪ/ (sky)
	• Omission of final consonant	/snaɪl/ → /naɪ/ (snail)
	• Assimilation (consonant harmony)	/j↔lo/ → /l↔lo/ (yellow)
	II Systemic Modifications	/s↔vən/ → /t↔vən/ (seven)
	• Stopping	/ʃugə/ → /tʃugə/ (sugar)
	• Affrication	/ɻr↔ndʒ/ → /ɻjɛn/ (orange)
	• Liquid gliding	/pleɪt/ → /pəleɪt/ (plate)

		• Schwa insertion	/nos/ → /noʃ/ (nose)
		• Palatisation	/d↵g/ → /d↵k/ (dog)
		• Devoicing of final consonant	
3;7	I	Structural Modifications	
		• Consonant cluster reduction	/flavə/ → /favə/ (flower)
		• Omission of initial consonant	/jɛlo/ → /lɛlo/ (yellow)
		• Assimilation (consonant harmony)	/sizəs/ → /zizə/ (scissors)
	II	Systemic Modifications	/trɛʃə/ → / trɛdə / (treasure)
		• Stopping	/rɪbən/ → /d|ibən/ (ribbon)
		• Affrication	/bred/ → /bwed/ (bread)
		• Liquid gliding	/tri/ → /təwi/ (tree)
		• Schwa insertion	/kreəb/ → /kreəp/ (crab)
		• Devoicing of final consonant	
4;8	I	Systemic Modifications	
		• Stopping	/fɛðə/ → /fɛdə/ (feather)
		• Liquid replacement	/gridi/ → /glidi/ (greedy)
		• Liquid gliding	/zɪro/ → /zɪwo/ (zero)
		• Devoicing of final consonant	/wɛb/→ /wɛp/ (web)
5;4	I	Systemic Modifications	
		• Stopping	/tið/ → /tit/ (teeth)
		• Liquid replacement	/gridi/ → /glidi/ (greedy)
6;5	I	Systemic Modifications	
		• Stopping	/tið/ → /tit/ (teeth)
		• Devoicing of final consonant	/wɛb/→ /wɛp/ (web)

Therefore, it can be inferred that the absence or inconsistent use of the phonemes /ð/, /θ/ and /|/ does not indicate a speech defect. One possible solution to identify deviant production or development then is to analyse differences between child and caregiver.

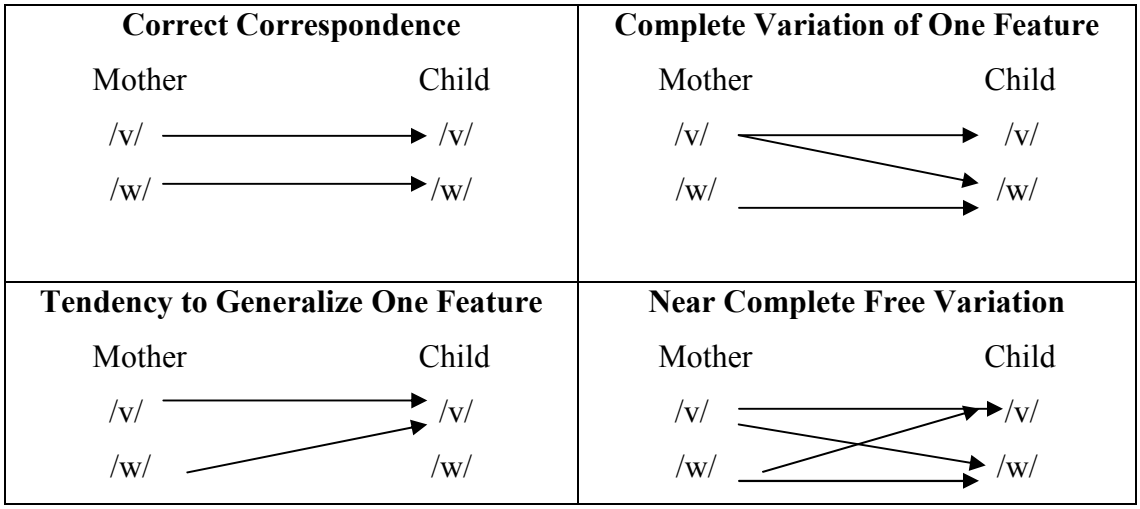
CHILD'S PHONEMIC INVENTORY

The phonemic inventory of the children mirrored that of their parents. The marked difference was the *presence of affricates* in subject aged 2;4 and older. Affricates are recorded in foreign norms as being present in children aged 3;8 and older (Grunwell 1981) and between ages 3 to 8 years by Prather, Hedrick & Kern (1991). These sounds are influenced by early linguistic exposure as seen in common early words for the child. Waterson's Prosodic theory (1971) supports this possibility. Eimas (1985) also relates that children's ability to perceive these differences begin when they are babies. Ng (unpublished,1999) also found affricates to be produced as early as 2;9 years by Chinese descent children who spoke ME.

PHONEME /V/ AND /W/ AS ALLOPHONES

The findings also revealed that Indian descent speakers of ME, both child and adults, do not make a clear distinction with the production of the phoneme /v/ and /w/ as separate phonemes. They are used as two allophones of a same phoneme. This did not change word meaning and affect intelligibility. For example, production of /v↵ɹtʃ/ or /w↵ɹtʃ/ still meant 'watch'. This is consistent with findings of Indian English speakers (Sahgal & Agnihotri 1988; Bansal 1969). Some suggested reasons for this include possible mandibular looseness among Indians relenting to difficulty with active lip rounding (Sahgal & Agnihotri, 1988). Bansal (1969) reported the absence of the phoneme /w/ in Tamil phonemic inventory. Individual variation of production of /v/ and /w/ as allophones were seen in this study. Cruttenden (1972) described the free variation use of allophones according to 4 possible templates: correct correspondence, complete variation of one feature, tendency to generalize one feature, near complete free variation)

TABLE 3 Free Variation in Allophones



PHONOLOGICAL PROCESSES

The results of this study evidenced the decrease of types of phonological processes with age.

TABLE 4 Number of phonological processes with age.

	Subject 2;4	**Subject 3;7**	**Subject 4;8**	**Subject 5;4**	**Subject 6;5**
Number of DIFFERENT phonological processes seen	9	8	4	2	2

This finding is similar to foreign studies (Roberts, Burchinal & Foto 1990) as well as local studies (Ng 1999, unpublished). This supports the Natural Theory by Stampe (1969). Stampe stresses the naturalistic process as dependent on one's speech ability. The speech sound production of a child is modified as their motor development does not

correspond with their desire to imitate the adult's production accurately. Roberts, Burchinal & Foto (1990) also stressed that the usage of phonological processes should decrease markedly after the age of 4 and any increase of this would have a clinical implication to the high possibility of an articulation/ phonological disorder.

Two issues which should always be on the mind of speech-language pathologist are 'individual variation' and 'gradualism & regularization' in development (Crystal 1981). These issues are clear when a study involves a small number of subjects (Crystal 1981). Individual variation in phonological development is influenced by frequency of lexical use (different words) in the child's environment and may affect the rate and pattern of phoneme acquisition. The second issue, gradualism & regularization implies that internal changes may be seen in a child's speech pattern of any age. This is because phonological development relies highly on ongoing vocabulary and use, be it in words or at the sentence level. Therefore, a child may produce the word inconsistently in different levels (i.e word level versus conversational/narrative level). Subject 3;7 years demonstrated this phenomenon in the production of the word 'orange' which was /od | end | / at the single word level but /ojend | / in the narrative level. The phoneme /r/ in this word which is not established, is realised and therefore produced differently.

CONCLUSIONS

CLINICAL IMPLICATIONS OF STUDY

The results of this study, although preliminary, highlight and validate the need for children's phonological system to be compared to their main caregivers. This will help the speech-language pathologist ascertain if the presence of an oddly produced word or phoneme indicates misarticulation or phonological defects which needs treatment or otherwise.

The findings of this study also call for detailed attention from the speech-language pathologist in making a diagnosis and planning intervention goals for local children. As this study validates key differences when compared to foreign studies, foreign norms must be used with care and caution. The differences found validates the need for local normative data to be researched and made available.

LIMITATIONS & RECOMMENDATIONS

The limitations of this study include the small number of subjects, hindering a complete and thorough generalisation to the Malaysian population. It is recommended that a more detailed study with a larger number of subjects be considered for interested future researchers. The gap of one year between each age group did not provide enough detail for young pre-schoolers. It would be wise to have subjects represented at age gaps of between 3 to 6 months in future studies so clearer patterns are seen and analysed. As children of today progress quick developmentally, it is recommended that children aged one year be included as well. It is also good to consider having more than one representative of the child's linguistic exposure in future studies i.e. including the father, teachers, caregivers to study the effect of environmental influences. Some researchers

suggest long term descriptive studies to document patterns throughout the child's developmental stages (Stoel-Gammon & Dunn 1985) as phonological changes can be seen more accurately. Contextual influences were not included in the methodology of this study i.e. variation of production of a consonant when placed with various neighbouring vowels. McGregor & Schwartz (1992) state that "*Production data alone are insufficient to detail the complexities of a phonological system. Further analyses of both perceptual and articulatory abilities are necessary to describe phonological development more fully."*

It is hoped that the finding of this study encourages more research interest and funding in the field of Speech Pathology and treatment in Malaysia.

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