THE PHONOLOGICAL DEVELOPMENT IN BILINGUAL CHILDREN: THE CASE OF HINDI AND PUNJABI BILINGUALS IN DELHI

Dissertation submitted to the Jawaharlal Nehru University in partial fulfilment for the award of the degree of

MASTER OF PHILOSOPHY

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This thesis entitled **"THE PHONOLOGICAL DEVELOPMENT IN BILINGUAL CHILDREN : THE CASE OF HINDI AND PUNJABI BILINGUALS IN DELHI"**, submitted by **Ms. TULIKA CHANDRA**, Centre of Linguistics and English, School of Languages, Jawaharlal Nehru University, New Delhi for the award of the degree of **MASTER OF PHILOSOPHY**, is an original work and has not been submitted so far in part or in full, for any other degree or diploma of any other university.

This may be placed before the examiners for evaluation for the award of the degree of **MASTER OF PHILOSOPHY**.

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To my father Dr. N. C. Srivastava.

CONTENTS

LIST OF CHARTS

SYMBOLS AND ABBREVIATIONS USED

/ /	Phonemic transcription
[ ]	Allophonic variation
( )	Loan sounds
E ə	ɛ , vowel /ɛ/ ɑ
UMC	Upper Middle Class
LMC	Lower Middle Class
I	Word initial position
M	Word medial position
F	Word final position
IMF	All three positions: initial medial and final
CR	Correct response
PCR	Percentage of correct response.

CHAPTER - I

INTRODUCTION

`In all parallels between child language (or aphasia) and the language of the world, what is most conclusive is the identity of structural laws which determines always and everywhere, what does or will exist in the language of the individual and in the languages of the society. In other words, the same hierarchy of values always underlies every increase and loss within any given phonological system.[1]

(Jakobson, as quoted in Holenstein, 1976, pp.173).

Jakobson's theory, published in his `Child Language, Aphasia and Phonological Universal' (1941/68) is perhaps the best known theory of phonological development. `Jakobson specified for acquisition of sound classes an invariant chronological sequence, one that will be followed by all children regardless of the language being learned'.

(Macken, 1980 ed. by Komshian, Ferguson).

Jakobson's study, although remains as a landmark in the field of child language acquisition, studies in this field dates back well over hundred years. It has been considerable changes in both methods and theoretical orientation.

The period of `diary studies': At first, there were `diary studies' which are of enormous value now and the data from

these studies provide valuable material for further studies. These studies were mostly the `parental diaries'. (Ingram, 1989). These diary studies serve as a rich source to this topic, both in English as well as in other languages. The earliest diary is said to be of H. Taine, with the publication of his daughter's linguistic development, in 1876. This was followed by many other important diary studies; as of Preyer (1889), Clara & Wilhelm Stern (1907), Leopold (1939-49), Velten (1943), Lewis (1936), Weir (1962), Smith (1973).

The Period of Large Sample Studies: While diary studies still continue, at around the First World War, there was a major shift in the methodology. Ingram (1989) calls this period as, `the period of large sample studies'. While diary studies were longitudinal studies, these studies were cross-sectional studies. `large Sample' refers to the size of the sample of children used. The subjects were selected from similar socio-economic class and there were equal number of male and female children. The emphasis was mainly on `behaviourism'. Some of the major sample studies were conducted between 1926 and 1957. as of Smith (1926), McCarthy (1930), Young (1941), Templin (1957).

`Period of longitudinal sampling': There was a change in methodology by 1957, which Ingram (1989) calls `period of

longitudinal sampling'. The study samples of these studies differ from diary studies, as to; diary studies consist of short notes while these studies consist of complete language samples for some predetermined criteria.

Studies in this area have explained the phonological acquisition by appealing to the principle of "Least Physiological Effort": This principle is generally known as "Schultze's law of succession' (1880) for phonological development; named after Schultze. Schultze proved that those speech sounds which require `least physiological effort for their production where learned first by the children'. (Jakobson, as translated by Keiler 1968). This principle is often opposed and has faced criticism on, of what `the least physiological effort' actually meant. This principle can still be found in the newer works on child language acquisition.

Among the early works, the study of the Belgian linguist Antoine Gregoire (1939-49) is remarkable. Jakobson (1941/1968) mentions Antoine's work stating that, it shows step by step the emergence of linguistic structure and it has paved way for further studies, which had remained unclear in the older literature. Antoine expressed that pre-speech vocal behaviour was a completely random activity, subject to no developmental laws.

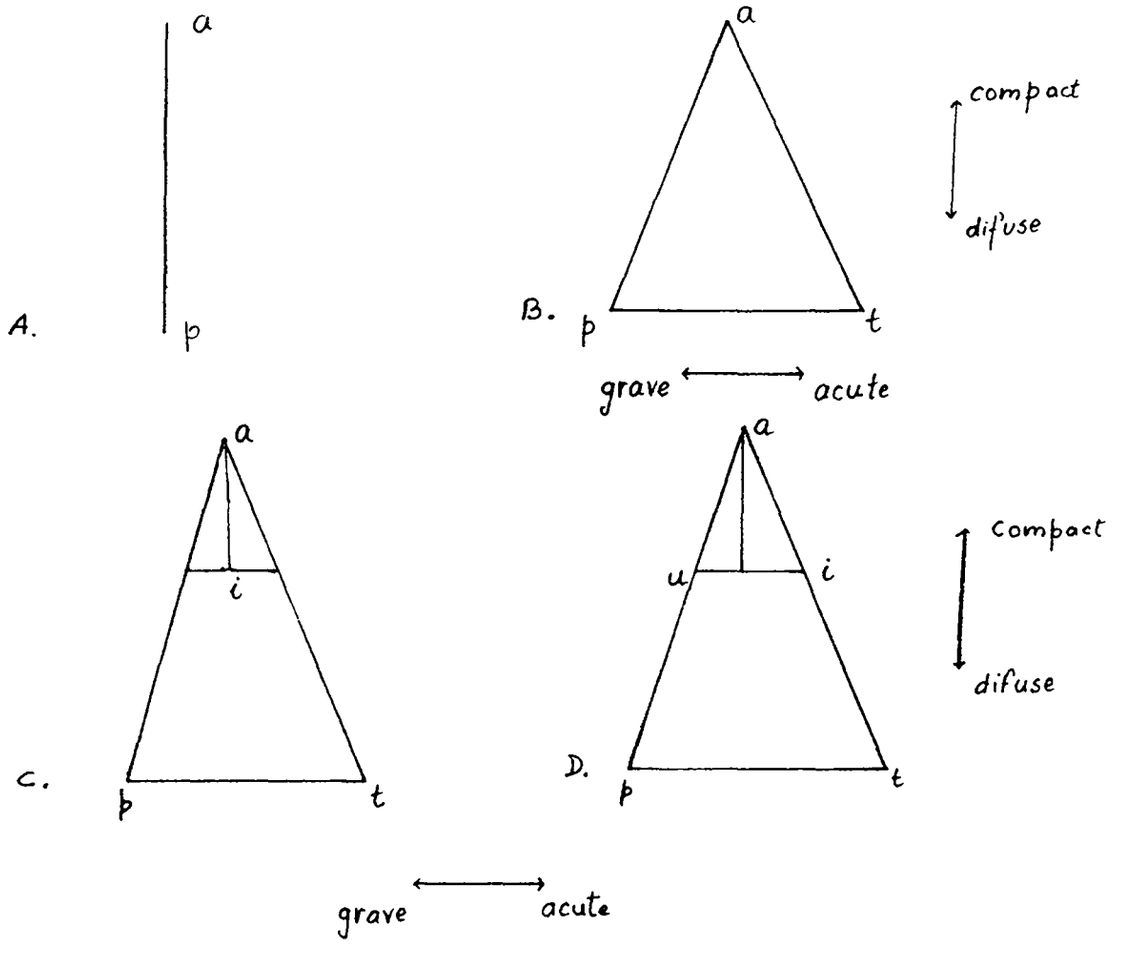
In 1941, the study of child phonology took a great leap as Roman Jakobson's highly significant work appeared in his book `Kinderpache, Aphasic and All Gemeine Lantgesetze' (later translated by Keiler, 1968). Since 1941, a number of authors have presented evidence either supportive of or opposed to Jakobson's model.

Jakobson states that whatever the language be for the child to acquire, every description based on careful observation repeatedly confirms the fact that `relative chronological order of phonological acquisition remains everywhere and at all the times the same', and `while the phonological acquisition in child language appears to be stable in its fundamental characteristics, the speed of succession in contrast depends on the individual and is exceedingly variable.'
(Jakobson; (1941) translation by Keiler 1968).

Jakobson proposes that the child learns to make various distinctive features in a developmental sequence, the consonant-vowel distinction being learned first. Rarely used distinctive features in language, are learnt latest by the child. (As reported by Caroll in S.Saporta (ed.) 1960).

The first few phases in the acquisition of phonemic systems is illustrated in the form of triangles by Jakobson. These phonological triangles will serve as a prototype for this study, which will be in the context of bilingual children. The triagles: (from A to E).

Triangles showing the five phases in the continuation of the three-fold phonological triangles; (Holenstein, 1976.)



As explained by means of these triangles, vowels and consonants are joined in a unified system. The fundamental split can be seen along the compact - diffuse axis. This shows the contrast between the back open vowel /a/ and closed front consonant /p/. The successive stage is formed by the split between the consonants, that of oral and nasal phonemes (/p/-/m/). At the same stage, the pole of high and concentrated energy /a/ contrasts with low energy stops /p/ and /t/. Both stops are opposed to each other by a predominance of one or other of the frequency spectrum as the `gravity' and `acuteness' poles. The primary triangle then, splits into two - vocalic and cousonantal. The most characteristic feature of vowels is their compactness and so their first internalised and sometimes only split takes place along the compact-diffuse axis. Since, the contrast acute/grave gradually prevails as compactness decreases, it forms the first and sometimes only consonantal axis. On the other hand, the vocalic split along the consonantal axis acute/grave (/i/-/u/) is secondary. Similarly, the consonantal split along the vocalic axis, compact-diffuse (/k/-/t/) does not occur until after the specific split into acute and grave consonants.

(Jakobson (1941) as explained by the Holenstein 1976).

Although subsequent researchers did find evidence contrary to some of Jakobson's proposals covering the order

of acquisition but the importance of his proposals can no be questioned. E Clark (1971) is; Jakobson deals only with the acquisition of segmental phonology and leaves some important aspects as stress and intonation. He also ignores of what may happen with respect to a particular opposition depending on its position in the word. A sound can occur in three different position in a word i.e. initially, medially and finally. Moscowitz (1970) found that the initial position is one in which there is maximum contrast within the young child's phonological system. In the medial position there is much more variability and the use of final position consonants develop much after in the developing system. Ingram (1989) draws out the point that Jakobson does not discusse as to when a child phonology of language. A will be different from another child's phonology of language B. His predictions are mostly about the earliest sounds a child acquires. Ingram states that, it is difficult to draw a universal conclusion based on Jakobson's theory. Another important point drawn out by

Velten (1943) was the first major phonological diary to appear in support of Jakobson's theory of phonological acquisition. He had taken into account the acquisition of language of his daughter Joan. The child was brought up in an environment where English, French and Norwegian were

frequently spoken. He discusses the major phnological patterns acquired by his daughter.

Another important diary study was made by Leopold on his daughter, Hilgard, in his book `Sound Learning in the First Years' (1947, vol.2). This study was different from the previous studies, as it was on a bilingual child. The consonants acquired by her at the age of one year eleven months were small in comparison to other monolingual children of her age. This was perhaps, due to lot of homonym present in her speech.

(Ingram 1989).

R. Burling (1959) made a diary study of his son who was brought up in India where the languages Garo and English were spoken to him. He found that Stephen's acquisition pattern was very similar to that suggested by Jakobson, except that Stephen added to these the cross-cutting distinction of aspiration in the consonants and unvoicing of the vowels. He was not slower to articulate velar stops, unlike Leopold's daughter. Other studies on bilingual children as of Velten and Leopold's state that a large number of homonyms appeared in their daughter's speech which hindered their ability to produce phonemic contrasts. This was not found in Stephen's case.

Smith (1973) made a detailed study of his son's language acquisition, who was raised in a multilingual environment. The child was brought up where English was the main language and Hindi, Marathi were also spoken to him. In the process of describing A's phonological development, Smith expected an identifiable set of regularities in the child's spoken language, but he found a wider range of phenomenon, which he identifies in seven points. . . . . Some of them can be seen as discussed by Ingram (1989) 1st of his phenomenon was of occurence of systematic exceptions to general regularites. 2nd is of `non-congruence'. Other phenemenon are of - use of `non-native sounds', `puzzles', `recidivision' and `observation of the change in the childs phonological system where he begins to change a particualr correspondence between his sounds and those of the adult language'.

G.P. Srivastava (1974) observed a monolingual child, speaking Hindi and investigated the acquisition of consonants in the child's pre-language and early language stages. He makes broad statements as, that by the age of two years a Hindi-speaking child acquires the aspiration sounds. He states that Hindi-speaking children do not follow the pattern suggested by McCarthy (1966) that the development of consonant learning progress from back of the oral cavity towards the front.

(Indian Linguistics, Vol.35).

Another important study is by Ferguson and Farewell (1975) which refers to 'salience and avoidance' as a characteristic of early phonological development. They claimed that the children tend to produce or acquire words that contain sounds within their language system and avoid those that do not.

Pye, Ingram, and List (1987) conducted their study on Quiché speaking children. They collected data and compared it to a core set of initial consonants for English, proposed by Ingram (1981); where 15 children were analysed by the same procedure. While there were some similarities, as of nasals and voiceless stops, there were more dissimilarities. The Quiche children were acquiring a very different set of consonants as compared to their English counterparts. The data showed that the child acquires sounds that are most frequently heard. The data indicates that children begin sounds during the period of single word utterances to acquire the phonological system of their language.

Phonological development in bilingual situation is expected to be different as compared to a monolingual environment because the child is acquiring two or more phonological patterns of languages heard by him. Much of the cross-linguistic studies support the hypotheses that

universal patterns do appear to exist in phonological development, but there are also data which suggest that differences do exist, as Macken and Barton's (1980) research on the development of voicing contrasts in Mexican-American, Spanish speaking 2-4 years old children demonstrates as repated in the Journal of Child language, Vol.14 b y Smith.

Martin Ball (1984) argues that there are several factors which effect the phonological development of a bilingual child: (a) the distinction noted between simultaneous acquisition of the two (or more) languages and successive acquisition (L_1 followed by L_2) (b) the possible L_1-L_2 (first language - second language) interference depending upon the statuses of the languages being acquired, (c) Apart from the area of interference, does the acquisition of two languages imply that identical phonological process are used for both?

(M.Ball, ed. N. Miller, 1984).

Studies in child language acquisition can be divided into three broad types:

a) $\underline{L_1}$ <u>acquisition</u>: it is monolingual situation where the child acquires a single language. Studies conducted on such children brought up in monolingual environment came under the 1st type.

b) L_1 acquisition + L_2 added in different domains: After the child acquires the first language, second language is learnt or acquired, depending upon the different domains, age and the reason of learning the language. This is a bilingual situation, which C. Kessler (1984) calls 'sequential bilingulism'. Studies conducted in such learning/acquisition situations can be classified as type b.

c) [L_1 + L_2] as L_1 acquisition: Where a child acquires both L_1 and L_2 simultaneously, that is, where a child is exposed to two or more languages from the infancy, and both the languages are acquired as the first language. Kessler (1984) calls this as, 'Simultaneous bilingualism'. The child is exposed to two languages at the same time, in all domains of language use. Studies conducted in these situation came under the third type.

Most of the studies mentioned (please see page 11) fall into the type (a) or (b). That is, either the child is acquiring only one language as in the studies by Jakobson (1941/68), Smith (1973) and others; or a child is acquiring a second language in an environment where mother-tongue plays a dominant role in the acquisition of subsequent language/languages. The present study concentrates on children from type (c), where they acquire two or more languages as their L_1. The present study concentrats on

Punjabi children falls under type (c). The target group consists of children coming from Punjabi families residing in Delhi, where practically every member of the family is a bilingual. Hindi and Punjabi both the languages are used in the all domains of language use, have environment as well. So the child is exposed to Hindi and Punjabi both at home. Some members speeking more Punjabi than Hindi (old generation) while the others were using more Hindi than Panjabi (the younger generation).

STAGES OF LANGUAGE DEVELOPMENT

Since a bilingual child's language development is being studied in the light of all earlier studies on monolingual children, it is obligatory for us to take a look at some of the universal features and patterns observed in the case of monolingual children.

Several studies including that of Stern (1924), D. Crystal (1976), E Clark (1977), Ingram (1989) and others have concentrated on different stages of language acquisition depending on the specific goals of the study. All of these, however do recognize some stages in the speech/language development. Some of the clearly marked stages in a child's language development as recognised by Crystal (1976) are tentatively listed below:

Stage 1: Between birth and around six months age, when children use non-linguistic, biologically conditioned vocalisations.

Stage 2: From six months to around nine months age, the vocatization begins to take on some characteristics of a specific language, as features of pitch, rhythm etc.

Stage 3: From nine months to around twelve months, it is possible to identify segments of vocalisation that seem to correspond to words. Though intonation and gesture at this stage are extremely ambiguous and indeterminate features of expression.

Stage 4: The learning of sound systems of the language begin then and continues till the age of 7-8 years.
(Crystal, 1976).

Stage 5: Clark (1977) recognises the last stage as that upto 5 years, saying that most of the phonological system is acquired by the time child is five years of age, except for a few exception.

Some studies including that of Clark (1977) express that the last phase in this progression towards adult like speech sounds usually begins sometime between the age of nine months and twelve months.

Some studies, including Jakobson (1941/68) suggest that there is a sharp discontinuity between babbling stage in vocalisation and the onset of actual speech. Jakobson proposed two separate periods of phonological development, viz.,

(i) Babbling stage: in which the infant is given the ability to babble or produce all possible speech sounds.

(ii) The second period dates after an abrupt discontinuity, from the point at which the child recognises that, certain sounds have a distinct linguistic value and are used for designation.

(Jakobson, Translation by Keiler (1968)).

THE SCOPE AND DOMAIN OF THE PRESENT INVESTIGATION

This study is to investigate the phonological development in bilingual children. The sample group consists of children belonging to the families where both Punjabi and Hindi are spoken and children acquire these two languages simultaneously. They acquire Hindi and Punjabi as their first language, i.e. (L_1 + L_2) acquired as L_1. Punjabi and Hindi are cognate languages as they belong to the Indo-Aryan family. The phonological patterns of these two languages is discussed an compared in the following chapter on methodology.

Special features of the context of L_1 acquisition under this study:

1. L_1 can be represented [L_1 + L_2]
2. L_1 and L_2 are Hindi and Punjabi.
3. Punjabi being the language of ethnic identity, may be called the mother tongue but may or may not be called L_1 which the other language, Hindi is not the mother tongue, but may or may not be called L_2. This is because both the languages are constently being used in all domains to which the child is exposed.
4. Hindi is generaly dominant in the speech of the younger generation (child's parents etc.) while Punjabi is generally dominant in the speech of the older generation (child's grandparents and other).
5. Hindi and Punjabi are cognate languages. So the child is exposed to, sometimes words with two different pronunciations in the same contexts, e.g.

   kə̃m and kɔmm (ɔ)
   də̃t and dɔnd
   cə̃nd and cɔnn(ɔ) and many others.

   So if a child substitutes [a] for [ɔ] and vice-versa in such words then the explanation can only be provided by the genetic relationship between the languages and hence the two congnates (words) in question. Such conguates and subsequent phonemic substitution cannot be treated at par with the substitutions of, say [k] by [t] in Hindi and Punjabi words alike.

6. Loan words especially those from English which have been subsitued in the language of Delhietes (Hindi as well as Punjabi) give another dimenion to the phonemics of this bilingual set up e.g. words like toffee, coffee, bed, net with short vowels [ ] and [e] do find their way into a child's vocabulary and hence his phonemic inventary.

Ideally speaking, for the present study, one should begin from stage 3 of language acquisition, (age - 1 year) and go till the age where he acquires all the sounds. Since it is not a longitudinal study and due to the time constraint, elicitation of data from very small children very difficult and that is why the lower age was increased to one and a half years. (1 year and nine months). The oldest child in the target group is four and half years.

Since the normal order and patterning of verbal development of monolingual has been studied in great detail, this study will try to investigate whether a similar and definite order of development can be demonstrated in the emergence of a phonemic pattern in case of a bilingual child as well. Some specific questions that we would like to we would like to tackle in the present study regarding the facts of language development can be tentatively framed thus:

a) Are there common pattern of development in all children whether they are monolingual or bilingual ?

b) Is language development in a monolingual child different from that of a bilingual or multilingual child?

c) If so, then in what ways?

d) In a bilingual child, what are the patterns he acquires first? In other words, which oppositions develop faster?

e) Does he acquire a common core of phonemes of the two or more language he is exposed to?

f) What are the stages of acquisition of the phonemic contrast that are common to both the languages?

g) What are the stages of acquisition of speech sounds that are phonemic only in Hindi and not in Punjabi?

h) What are the stages of acquisition of speech sounds that are phonemic in Punjabi and not in Hindi?

i) How does a child handle cognates ? As synonyms or as variants with definite phonological rules to govern them.

Such studies in case of both monolingual and bilingual will not only enhance our understanding of the language in relation to human mind, will also have application in other fields in which knowledge of the structure of language is significant, eg. in the study of aphasics or those with agnosia or any other deviations in the speech and/or language development.

The phonemes of Hindi and Punjabi are discussed in the following chapter on Methodology. The same chapter i.e., 'Methodology and Analytical Procedures' includes apart from the procedural steps and the details of the articulation tests, the target group, variables and also a brief description of the analytical procedures followed in the present study.

The third and the fourth chapters are devoted to analysis and discussion while the last chapter contains summary and conclusions.

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CHAPTER II

METHODOLOGY AND ANALYTICAL PROCEDURES

Various methodologies and models have been in use for a number of years for conducting studies related to speech and language acquisition. David Crystal (1980,P16 & 17) for instance, describes two such models for the studies related to speech, particularly for studying the deviant speech behaviour. These two models currently in use are:

1. **The Medical Model**
2. **The Behavioural Model**

He describes both these models in use in the study of deviant speech in great detail explaining that, one category derives from principles and practice of medical sciences or contributing disciplines, and this is usually referred to as the medical model. The other derives from the behavioural sciences (psychology and linguistics in particular) and is usually referred to as the behavioural model.

The medical model tries to classify and explain linguistic abnormality and gives emphasis to the identification of the cause of the disease. Behavioural model, on the other hand, begins with the description and analysis of the patient's (abnormal) linguistic behaviour in its own terms. Here, abnormality is compared with normal behaviour and is then treated. Although, the medical model is used in the speech therapy clinics and rehabilitation

centers; for studying the normal child, behavioural model is the most appropriate and applicable and thus, chosen for our study. The steps of behavioural model are enumerated here with certain changes made to suit the study i.e. for a normal child. The five interdependent steps usually followed in this model are :

1. the description of the linguistic behaviour of the subject, and the others who interact with the subject.

2. the analysis of these descriptions, with a view to demonstrate the systematic nature of speech.

3. the classification of subject's behaviour, primarily the linguistic aspect.

4. the assessment of the above mentioned behaviour.

5. the formulation of hypothesis and evaluation of the outcome of these hypotheses, as investigation proceeds.

For conducting studies in the field related to speech and language development, age of the subjects taken as sample plays an important role. Generally, the investigator chooses a particular age-group depending upon the aim and purpose of the investigation. Several studies, including that of Stern (1924), Jakobson (1941), Crystal (1976), Clark (1977) Ingram (1989) have concentrated on different stages of language development from birth to the age of nine years in a child.

For the present study, the ideal age group would have been from the age of one year to four years but due to time constrain and because it is very difficult to collect data from one year old child, we decided to increase the lower age limit to one year and nine months (i.e., 1;9 years). By the age of 1 year 6 or 8 months a child is presumed to have acquired most of the vowels and vowel phonemes. The upper age limit of the group was decided to be of 4;4 years because by this period it is presumed that the phonological pattern of the language is acquired, with the exception of a few phonemic contrasts in children. The sample group, was of hundred children between the age group of 1;9 years and 4;4 years with a comparable number of males and females in each group. The total number of children was later increased to 120 due to the need of adding some more data to a particular age group. Though many more children were interviewed, children who responded to well over 85% of the test queries were selected for the study. That is children who responded to more than 34 sounds out of total 40 test sounds, were selected.

THE TARGET GROUP

One hundred and twenty children (66 males and 54 females) belonging to a bilingual community were taken as the target group. The number of children was increased from 100 to 120 as it was found that the data

collected was inconsistent and we needed data from a few more children of the lower age groups. The children were residents of urban areas of Delhi and were speakers of both Hindi and Punjabi with occasional use of English. The mother tongue of these children/families is Punjabi. Each language in such a context is expected to be subjected to a high degree of interference from the other. (Also refer to sections in Introduction pp. 16 - 17).

All the 120 subjects were presumably normal children and none of these children had any physiological (speech or hearing) disability. Cases of delayed speech or any other kind of deviant speech, in any case, are recognisable and reported in clinics only after the age of 3 1/2 to 4 years. The effort was to choose the children from the same socio-linguistic and socio-cultural background. The socio-economic background of the children differed. We tried to ascertain the socio-economic class of the subjects using a very general criteria of the kind of school they go to viz. the Municipal school or the Public school. For our convenience we divided the middle class into two broad categories; **Upper middle class (UMC) and lower middle class (LMC).** We found that children studying in Public school or staying in private Creches for a part of the day generally come from the upper middle class, whereas children in Municipal or Corporation schools generally come from the lower middle class. Children below 3 years of lower middle class do not go to any school

or creches and therefore were interviewed in their family and home environment. Children from "Sahodaya Boys school, Delhi" were exceptions. This school has a mixed population consisting of children from extremely poor families, not so poor but still average of upper-lower income groups and also children from lower-middle class, middle-middle class and upper middle class. In this school the individuals and their teachers were specifically asked about their family background, income and their place of stay. Since tuition fees for the child depends upon the family income it was easy to ascertain the same from school record also.

Most of the children were from joint families, i.e. where parents, grandparents live together. Their grandparents spoke Punjabi and little Hindi but the parents mostly spoke Hindi amongst themselves. They speak Hindi as "**Delhi Hindi**" and they are fluent in the same multilingual jargon. They use Punjabi only with the older generation or outside where the other person speaks only Punjabi. Grandparents of these children used to speak Hindi to them, though with a Punjabi accent. Parents of these children, speak mostly in Hindi to them with occasional use of English and Punjabi words. Thus, there was a linguistic gap between the older and the younger generations. Grandparents often complained that their grandchildren understood Punjabi very well but hardly ever spoke the language.

The child was growing up in an environment where he or she is exposed to Hindi and Punjabi by the speakers of both the languages within the family from his or her birth.

These children are perfect example of bilinguals learning two languages simultaneously as their first language. They therefore, have (L1 + L2) acquisition as L1 acquisition.

DISTRIBUTION OF THE SAMPLE :

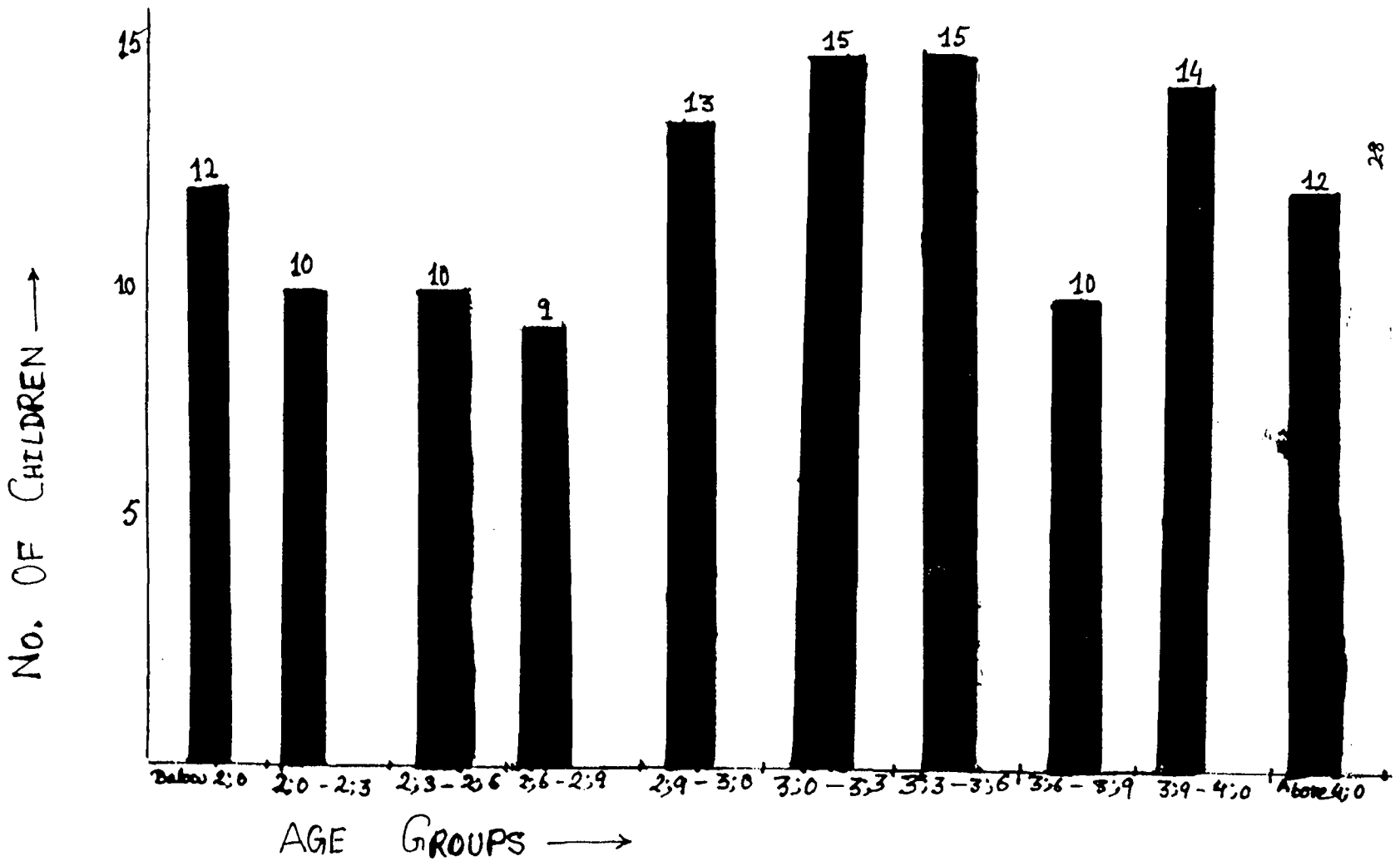
The three variables as discussed in the preceding section are: **Age, sex and class,.** Distribution of the sample vis-a-vis these three variables is indicated in the following charts.

A. These subjects were divided into 10 groups according to age. These groups are given below in chart no. 1 and 2.

CHART 1 AGE WISE DISTRIBUTION OF SAMPLE

SL.NO.	AGE GROUPS (In years; Months)	NO. OF SUBJECTS IN EACH AGE GROUP.
1.	below 2;0	12
2.	2;0 to 2;3	10
3.	2;3 to 2;6	10
4.	2;6 to 2;9	09
5.	2;9 to 3;0	13
6.	3;0 to 3;3	15
7.	3;3 to 3;6	15
8.	3;6 to 3;9	10
9.	3;9 to 4;0	14
10.	Above 4;0	12
	Total	120

CHART NO. 2


15
10
5
12
10
10
9
13
15
15
10
14
12
No. OF CHILDREN
Below 2;0
2;0 - 2;3
2;3 - 2;6
2;6 - 2;9
2;9 - 3;0
3;0 - 3;3
3;3 - 3;6
3;6 - 3;9
3;9 - 4;0
Above 4;0
AGE GROUPS

B. MALE-FEMALE DISTRIBUTION IN EVERY AGE GROUP :

The effort was to take an equal number of male and female children in every age group but it was not always possible. The number of male and female children in every age group, who actually responded to the test is given below in chart no. 3, and 4 .

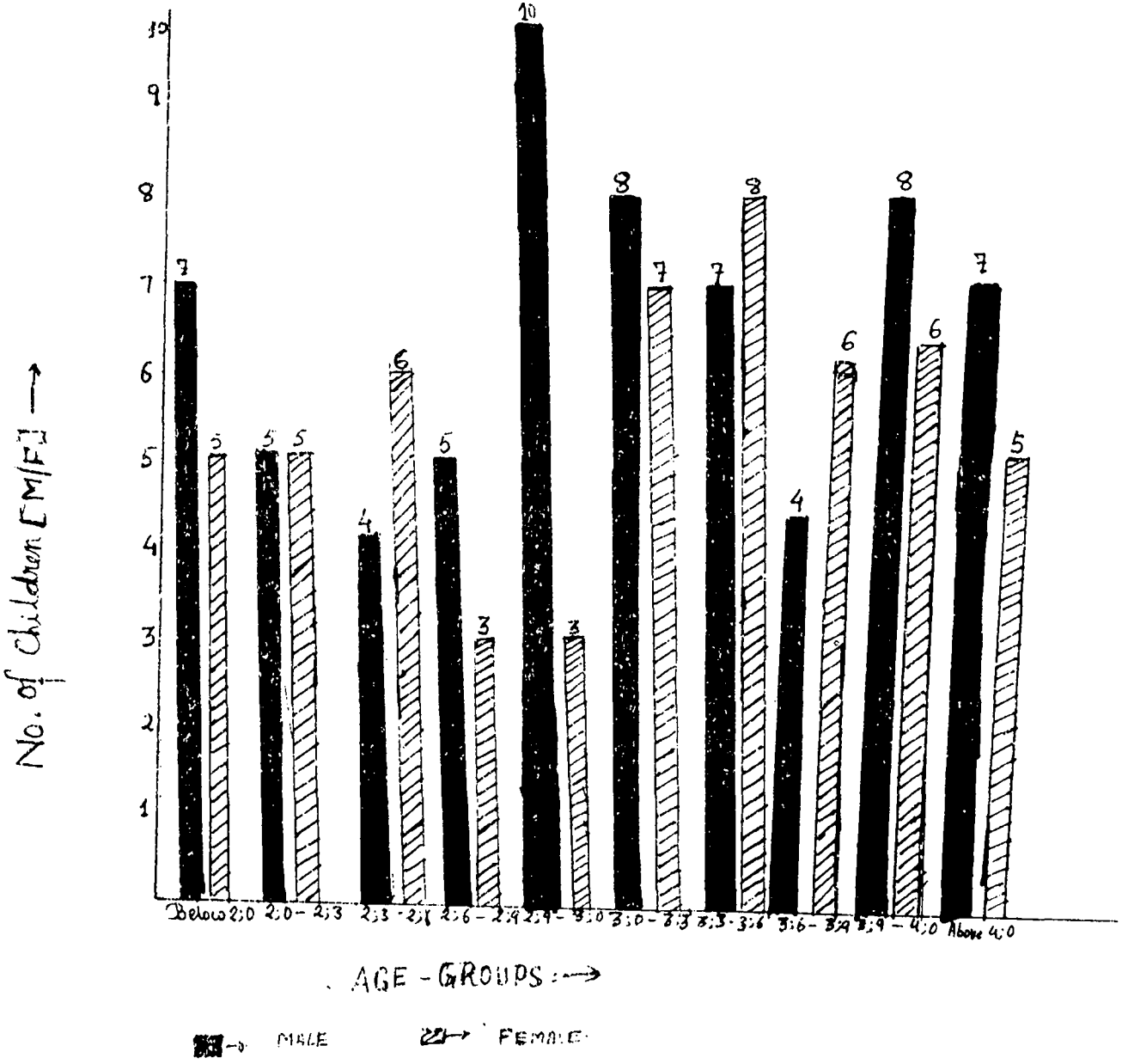
CHART NO. 3 AGE WISE DISTRIBUTION OF THE MALE AND FEMALE CHILDREN.

SL.NO.	AGE GROUPS (In years; Months)	SUBJECTS		TOTAL
		Male	Female	
1.	below 2;0	7	5	12
2.	2;0 to 2;3	5	5	10
3.	2;3 to 2;6	4	6	10
4.	2;6 to 2;9	6	3	09
5.	2;9 to 3;0	10	3	13
6.	3;0 to 3;3	8	7	15
7.	3;3 to 3;6	7	8	15
8.	3;6 to 3;9	4	6	10
9.	3;9 to 4;0	8	6	14
10.	Above 4;0	7	5	12
	Total	**66**	**54**	120

The female subjects were generally more talkative and extrovert than the male subjects. As far as their acquisition of the correct sounds and the actual phonemic

AGE GROUPS AND TOTAL NO. OF MALE - FEMALE SUBJECTS

CHART NO. 4



contrast is concerned, this will be seen in the 3rd chapter in classification and Analysis of the actual responses of these two groups.

C. Class-wise Distribution :

The subjects were also identified as belonging to either upper middle class or lower middle class. Class-wise distribution of the subject in every age group is shown in the chart 5 and 6.

CHART 5 AGE WISE DISTRIBUTION OF UMC AND LMC CHILDREN.

SL.NO.	AGE GROUPS (In years; Months)	NO. OF SUBJECTS UMC	LMC	TOTAL
1.	below 2;0	6	6	12
2.	2;0 to 2;3	6	4	10
3.	2;3 to 2;6	6	4	10
4.	2;6 to 2;9	5	4	09
5.	2;9 to 3;0	7	6	13
6.	3;0 to 3;3	9	6	15
7.	3;3 to 3;6	9	6	15
8.	3;6 to 3;9	6	4	10
9.	3;9 to 4;0	7	7	14
10.	Above 4;0	4	8	12
	Total	65	55	120

AGE GROUP AND CLASS-WISE DISTRIBUTION OF THE SUBJECTS

CHART NO. 6.

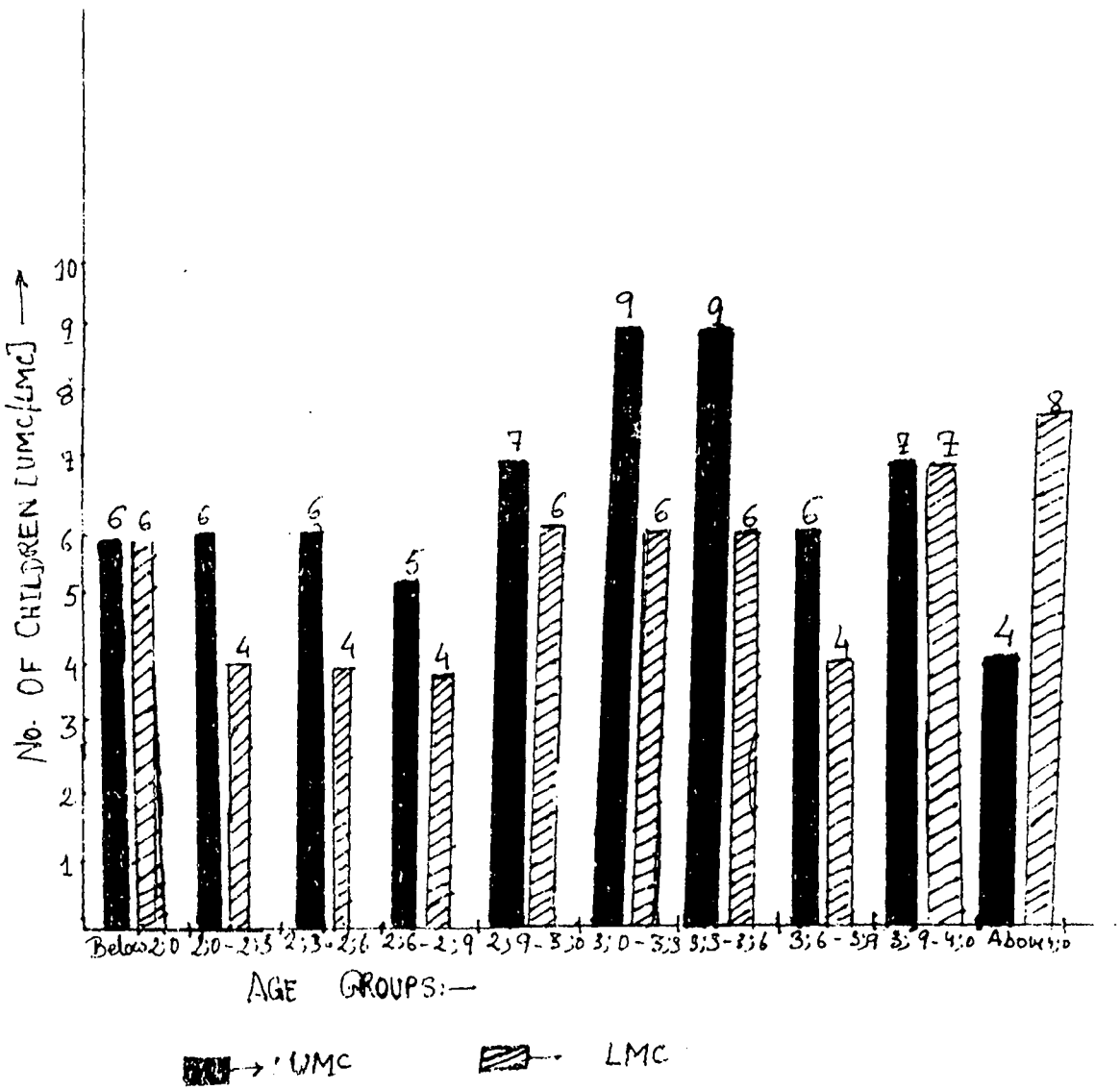


CHART NO. 7 AGE, SEX AND CLASS-WISE DISTRIBUTION OF THE SAMPLE

S.NO.	AGE-GROUPS (in years; months)	UKG		LKG		TOTAL
		Male	Female	Male	Female	
1.	below 2;0	3	2	4	2	12
2.	2;0 to 2;3	3	3	2	2	10
3.	2;3 to 2;6	2	4	2	2	10
4.	2;6 to 2;9	4	1	2	2	09
5.	2;9 to 3;0	5	1	5	1	13
6.	3;0 to 3;3	5	4	3	3	15
7.	3;3 to 3;6	4	5	1	3	13
8.	3;6 to 3;9	3	1	1	3	10
9.	3;9 to 4;0	3	4	5	2	14
10.	Above 4;0	2	2	5	3	12
	Total	34	31	32	23	120

THE LINGUISTIC SAMPLE

Hindi and Punjabi are cognate languages as they belong to the Indo-Aryan family. Therefore, a number of similarities can be seen in the two phonological patterns. The differences can also explained systematically in the context of their historical development. These are discussed later.

P.T.O

The two phonemic patterns are summed up by the means of following charts :

A PUNJABI PHONEMES : (CONSONANTS)

Point of Art. → / Manner of Art. ↓		Bila-bial	Labio-dental	Dental/ Alveolar	Retro-flex	Palat-al	Velar	Uvular
Stops	vl	p ph		t th	ʈ ʈh		k kh	
	vd	b		d	ɖ		g	
Affr.	vl					c ch		
	vd					j		
Fricat.	vl		(f)	s		š		h
	vd		v	z				
Nasals		m		n	ɳ		[ŋ]	
Lat.				l	[ɭ]*			
Trills				r				
Flaps					ɽ			
Approx.		[ω]				y		

*/l/ is dialectical; found in some dialects of Punjabi.

VOWEL PHONEMES OF PUNJABI

/ə/ /a/ /ɪ/ /i/ /ʊ/ /u/ /e/ /ɛ/ /ɔ/

TONES OF PUNJABI : 1. level /-/

2. high/rising /ˊ/

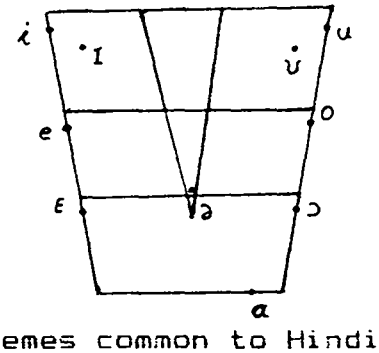
3. falling rising /ˇ/

(Gleason & Gill, 1972; pg. no.75).

B) PHONEMES OF HINDI: (CONSONANTS)

Point of Art. / Manner of Art.	Bila-bial	Labio-dental	Dental/ Alveolar	Retro-flex	Palat-al	Velar	Uvular
Stops vl	p ph		t th	ṭ ṭh		k kh	
Stops vd	b bh		d dh	ḍ ḍh		g gh	
Affr. vl					c ch		
Affr. vd					j jh		
Fricat. vl		(f)	s	ṣ	š		h
Fricat. vd		v	(z)				
Nasals	m		n	ṇ	[ɲ]	[ŋ]	
Lat.			l				
Trills			r				
Flaps				ṛ ṛh			
Approx.	[w]				y		

Vowels:



(Narang, 1984 pp.i)

a) The phonemes common to Hindi and Punjabi are:

Vowels /ə/ /a//ɪ/ /i/ /ʊ//u/ /e/ /ɛ/ /o/ /ɔ/

Consonants – /p/ /ph/ /b/ /m/ /t/ /th/ /d/ /n/ /ṭ/ /ṭh/ /ḍ/ /ṇ/ /c/ /ch/ /j/ /k/ /kh/ /g/ /ŋ/ /r/ /ṛ/ /l/ /s/ /š/ /h/ /z/ /y/ /w/

Vowels

Both Punjabi and Hindi have ten distinctive vowels each, but, with the development of tones, the vowels of Punjbai have phonological structure very different from that of Hindi. Some of the phonetic properties of vowels and tones are discussed by Gleason and Gill, 'A Reference Grammar of Punjabi', (1969).

'The vowels which serve as onsets of the tones are always longer than those which bear the tails. For example, the /i/ of /cira/ is longer than the /i/ of /cari/. Another important phonetic variation is due to the nature of tone itself. Under the mid-tone, the vowel is longer than that under high tone and is still longer under low tone. This phonetic length is sometimes an important clue for the recognition of the tone hence, its functional significance'.

(Gleason and Gill, 1969. Pg. No.32).

As we know, Hindi and Punjabi are cognates, that is they have a common ancestor - **Sanskrit.** Therefore, it is common to find similarities in the phonemic pattern of these languages. Many Sanskrit words are present in both languages with slight changes in their form. These can be seen in a few examples given as following :

P.T.O

From Sanskrit word [kəɾmal], Hindi equivalent is [kam] and in Punjabi it is [kəmmə]. In vowel due to change over ages, there are many words in Sanskrit where /ə/ has changed to /ɑ/ in Hindi and has remained /ə/ in Punjabi as,

SANSKRIT	HINDI	PUNJABI
/həst/	/hɑth/	/ɾəth(ə)/
/cəndrə/	/cãnd/	/cənn(ə)/
/cakšu/	/əkši/	/ãkh/	/əkh/

Similarly for vowel /ɪ/-/I, the Hindi-Punjabi cognates are,

	/ĩṭ/	/Iṭṭ(ə)/
	/ldhəɾ/	/Itthe/
	/sikh/	/sIkkh(ə)/

b) Sounds present in Hindi but not in Punjabi-

1. the voiced aspirated stops /bh/ /dh/ /gh/ /jh/.

Punjabi has three phonological oppositions in stops, whereas Hindi has four:

Punjabi	Hindi
p t ṭ c k	p t ṭ c k
b d ḍ j g	b d ḍ j g
ph th ṭh ch kh	ph th ṭh ch kh
	bh dh ḍh jh gh

In the initial position, the voiced aspirate of Hindi corresponds to the corresponding voiceless stop followed by low tone. Medially the Punjabi language has a voiced stop followed by low tone and in final position, the voiced stop

is preceeded by high tone. (Gleason and Gill, 1969 pp. 3')

EXAMPLES :

WORD INITIAL	WORD MEDIAL	WORD FINAL
/kòṛa/-/ghoṛa/	/sád/-/sadhu/	/lábh/-/labh/
/càṛu/-/jhaṛu/		/dúd/- /dudh/
/pàlu/-/bhalu/		

ii The retroflex flap /ṛh/

Hindi words like /pəṛhai/ and /pəṛh/ were tested for /ṛh/, which where pronounced as /pəṛai/ or /pəɖə/ or /pəɽə/ by the children from the target group.

c) Sounds present in Punjabi and not in Hindi -

1. The retroflex lateral /ɭ/ ; this phoneme is dialectal or regional variant and found only in some dialects of Punjabi and in the speech of some Punjabis in Delhi. [l] and [ɭ] are in allophonic variation found in Delhi Punjabi.

In the target group while testing [l] we did not find /l/ substituted with /ɭ/ at all. This indicates that /ɭ/ is not present in the speech of target group.

These are the phonemes taken for testing in the present study :

Consonants

Point of Art. / Manner of Art.	Bila-bial	Labio-dental	Dental/ Alveolar	Retro-flex	Palat-al	Velar	uvular
Stops vl	p ph		t th	ṭ ṭh		k kh	
Stops vd	b bh		d dh	ḍ ḍh		g gh	
Affr. vl					c ch		
Affr. vd					j jh		
Fricat. vl		(f)	s	[ṣ]	š		h
Fricat. vd		v	(z)				
Nasals	m		n	ṇ	[ɲ]	[ŋ]	
Lat.			l	[ɭ]			
Trills			r				
Flaps				ṛ ṛh			
Approx.	[w]				y		

Vowels :

PART OF THE TONGUE	FRONT		CENTRAL		BACK	
HEIGHT OF THE TONGUE	UR	R	UR	R	UR	R
HIGH	i					u
LOWER HIGH	I					U
HIGHER MID	e					o
MEAN MID			ə			
LOWER MID	E					ɔ
HIGHER LOW						
LOW					a	

THE ARTICULATION TEST

The phonemes were arranged according to the 'articulation test' chart, which is currently in use in most of the Speech and Hearing Clinics in Delhi. The chart was revised and some changes were made to suit the study. Each phoneme was tested by means of words using the phoneme in the initial, medial and final positions. /ḍh/, /ṛ/, /ṇ/ and /ḷ/ were exceptions; /ḍh/ is not found in the final position, while /ṛ/ /ṇ/ and /ḷ/ are not found in the initial positions.

The word list used in the test is as follows:

P.T.O.

	POSITION				POSITION		
Sounds	Initial	Medial	Final	Sounds	Initial	Medial	Final
p	pəṭəŋ	ṭopi	sãp	g	gəmla	bEgan	ag
ph	phul	muŋphəli	gilaf	gh	ghəṛi	kəŋghi	bagh
b	bəs	sabun	seb				
bh	bhalu	gobhi	jibh	y	ye	tayər	gay
m	mor	pəjama	am	r	rel	surəj	šer
				l	ləṛki	alu	bal
t	tala	kitab	dãt	v	vərša/vən	cavəl	nav
th	thali	hathi	hath	s	saṛi	pɛsa	ghas
d	dəvai	badam	cãnd	š	šəljəm	məšin	taš
dh	dhənuš	gədha	dudh	h	hərə	jəhaj	mũh
n	nəl	pani	kan	ṛ		gaṛi	peṛ
ṭ	ṭəmaṭər	moṭa	koṭ	ə	ənər	phəl	
ṭh	ṭhela	laṭhi	aṭh	a	am	dal	kala
ḍ	ḍəmru	jhanḍa	sũḍ	I	Imli	pIn	
ḍh	ḍholək	mẽḍhək		i	iṭ	cini	
				ʊ	ʊllʊ	mũh	
c	ciṛiya	kẼci	pãc	u	ũn/ũṭ	juta	alu
ch	chatəri	məchli	mũch	e	ek	kela	kele
j	juta	gajər	surəj	E	Enək	pEse	
jh	jhaṛu	bojha	sãnjh	o	oth	kot	foto
				ɔ	ɔrət	bɔl	
k	kela	cãku	nak				
kh	khərgoš	pəŋkha	ãkh				

TEST ADMINISTRATION AND ELICITATION PROCEDURE

Sounds common in Punjabi and Hindi and the sounds not common were included in the chart as shown above. These sounds were tested by means of meaningful words, common to both languages. The words were names of objects which a child comes across in his everyday life.

The test words were presented in the form of picture - cards using the **elicitation method.** These pictures were cut from different magazines and some were drawn by using coloured pencils. Each phoneme was presented in a form of picture - word. For example, to test /p/ in the initial position the word /pəʈəŋ/ was taken and a picture of a kite was pasted on the card.

Each subject was visited individually at school or home. The test was administered in a separate room, but sometimes due to the unavailability of a separate space the test was carried out in a corner of the class-room or playground. The child was shown these picture cards, (which were arranged according to the articulation test chart) and was asked to recognise and name the object. The response was immediately noted. For some words, where the child had some difficulty, he was asked to imitate the investigator. Very small children were asked to recite a poem or to narrate a story or to count the numbers or to name the kinship terms or the colours, and finally any mispronounced sound was retested by imitation procedure.

The other items used to facilitate the study were match sticks, toffees, fingers; to help them count, crycns and colour pens for identifying colours. Sometimes the objects around would also help us to get a required sound from the child.

The score was written down as:

i. a tick-mark (/) for a correct response.

ii. a cross-mark (x) for an incorrect response.

iii. a dash (-) for no response.

iv. for a substitution, the substituted phoneme was noted.

The incorrect responses were noted down clearly, identifying the substitution or the deviation in articulation as the case may be.

TESTING THE VALIDITY OF THE TEST

As a pretest, about ten children were interviewed and the test was administered on them. Sometimes a word or a concept is not there in the repertoire of the child. Sometimes the pictures chosen were not suitable enough and where found to be difficult for the child to recognise. As for the phoneme /d/ in word-initial position /dɔvat/ was chosen, but none of the ten children responded it as /dɔvat/. Instead the response was /Ink/ or /šiši/. So, /dɔvat/ was changed and /dɔvai/ which is more common in a child's repertoire, was introduced.

MODIFICATIONS

For /p/ in the medial poistion,
/dipɔk/ was replaced by /ṭopi/

For /m/ in the initial position,
/mala/ was replaced by /mor/

For /th/ in the initial position,
/thEla/ was replaced by /thali/

For /l/ in the medial position,
/kɔlɔm/ was replaced by /alu/

For /y/ in the initial position,
/yoga/ was replaced by /ye/ (this)

DATA ANALYSIS

a. TABULATION The data was classified and tabulated indicating variations from the expected response for each sound/each word/classes of society as against the three variables age, class and sex.

b. ANALYSIS Analysis was done from the general patterns which emerge from the tabulated responses. This is presented independently in the following chapter.

STATEMENT OF THE HYPOTHESES:

On the basis of the tabulation and general observation, tentative hypotheses were formulated. An evaluation of the outcome of these hypotheses is discussed on closer examination of the data.

SUMMARY AND CONCLUSION is presented in the last chapter.

CHAPTER - II

DATA CLASSIFICATION AND ANALYSIS

As indicated earlier, the target group consists of 120 children distributed into eight age-groups. The responses of each one of the subjects in these eight age-groups were carefully studied keeping in mind the aim and purpose of the present investigation.

It may not be out of place to repeat the previously raised question (in chapter 1), that we propose to answer on the basis of the present investigation and analysis. These questions are:

(a) Are there common patterns of development in all children whether they are monolingual or bilingual? If yes, what are they?

(b) Is language development in a monolingual child different from that of a bilingual or multilingual child?

(c) If so, then in what ways?

(d) In a bilingual child, what is the pattern of acquisition? In other words which oppositions develop faster?

(e) Does he acquire a common core of the two or more languages he is exposed to?

(f) What are the stages of acquisition of the phonemic contrast that are common to both the languages?

(g) What is the order of acquisition of speech sounds that are phonemic only in Hindi and not in Punjabi?

(h) And of Speech sounds that are phonemic only in Punjabi and not in Hindi?

As a first step towards the data classification and analysis the responses of the children were tabulated. While the chart indicating age-wise distribution of the sample and male and female division as well as class wise distribution has been presented earlier in the section on methodology, (see page no 27 to 33), the present section includes more charts indicating the acquisition of sounds vis-a-vis the variables: age, sex and class.

Given below is the description of each one of the charts in detail, thereby also indicating the classification.

THE THREE VARIABLES

1. **AGE:** Age-wise distribution of the sample. (please refer to page no.27 in Chapter II).

2. **SEX:** Male and Female in different age-groups (please refer to page no.29 in Chapter II).

3. **SOCIAL CLASS:** Upper middle class and lower middle class. (please refer to page no.31 in Chapter II).

Chart No. 7 (page no.33) indicates the distribition of the sample based on all the three variables. This chart is being reproduced here for ready reference.

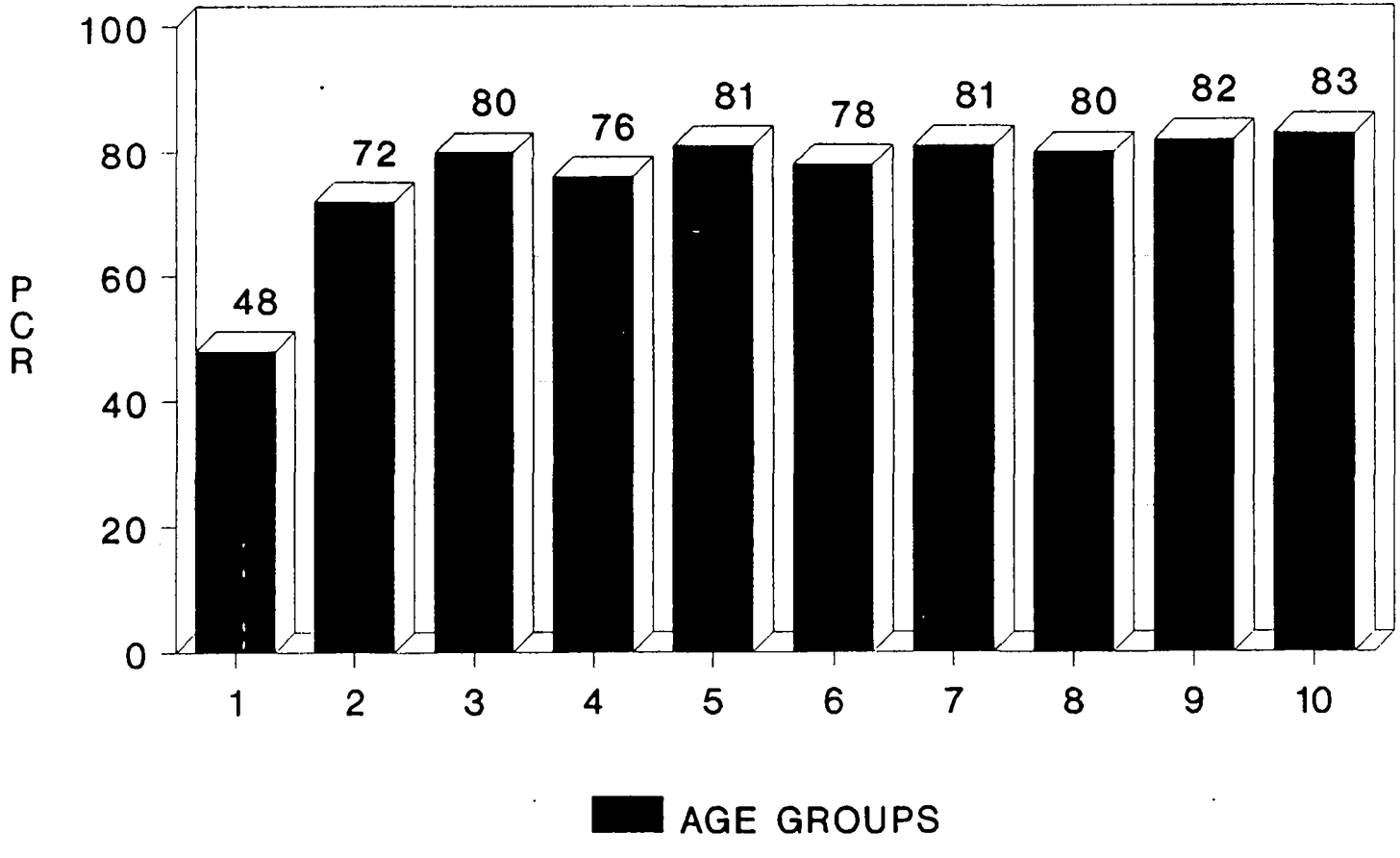
S.No.	Age-groups (in Years;Months)	UMC		LMC		Total
		MALE	FEMALE	MALE	FEMALE	
1.	below 2;0	3	3	4	2	12
2.	2;0 - 2;3	3	3	2	2	10
3.	2;3 - 2;6	2	4	2	2	10
4.	2;6 - 2;9	4	1	2	2	9
5.	2;9 - 3;0	5	2	5	1	13
6.	3;0 - 3;3	5	4	3	3	15
7.	3;3 - 3;6	4	5	3	3	15
8.	3;6 - 3;9	3	3	1	3	10
9.	3;9 - 4;0	3	4	5	2	14
10.	above 4;0	2	2	5	3	12
	Total	34	31	33	22	120

Chart no. 8: Total number of correct responses (all sounds, IMF positions) in different age groups. The chart no.8 (on page 50) indicates the percentage of sounds acquired in different age groups without making a distinction between the sounds of different kinds. Since different classes of speech sounds are put together it is difficult to come to any hypothesis from this chart alone. However, there is one clear indication that the first group i.e. children below 2 years of age are far behind the other age-groups. One finds a sudden change from 48% of sounds acquired by the first group to 72% acquisition in the next group. Another tentative conclusion that can be drawn from this table is that the last group of children from 4 years to 4;4 years shows the highest percentage of the total number of sounds acquired. The tentative hypothesis one could arrive at by this is, that the child is well equipped with the phonological pattern of his language by the time he reaches the age of 4 years.

Chart no. 9: Correct Responses (all sounds) against two variables age and sex.

In the chart no.9 (page 52) the percentage of sounds acquired is plotted against two variables - age as well as sex of the subjects. Generally speaking while collecting the data, the females were more extrovert and talkative than

CHART 8 : CORRECT RESPONSE OF ALL SOUNDS IN ALL THE AGE GROUPS



the males but as far as the specific test queries are concerned the male child seems to be doing better. As indicated in this chart there is no regularity in the pattern that we obtain in this data. In all the groups except the age group 5 & 10 (i.e. 2;9 - 3;0 and 4 years and above) one finds only a marginal difference in the percentage of sounds acquired by the male and female children. However, we may mention here again that all the different types of sounds are clubbed together in this chart also and that could be one of the reasons why there is no significant correlation between the two. When the total percentage of correct response by the total number of male and total number of female is calculated, chart no. 9.A. indicates that the acquisition by the male children is 75% and by the females is 73%. (the difference seems to be statistically insignificant)

Chart No. 10: Correct Responses (all sounds) against two Variables Age and Class.

The chart (page 55) indicates the percentage of correct responses plotted against two variables: age and class.

As discussed in the earlier chapter, we tried to ascertain the class of the subjects using very general criteria like Municipal School and Public School distinction, ~~finily~~ family income etc. (see section pp. 24).

CHART 9 : MALE VS.FEMALE DISTRIBUTION PERCENTAGE SHOWING CORRECT RESPONSE IN ALL AGE GROUPS

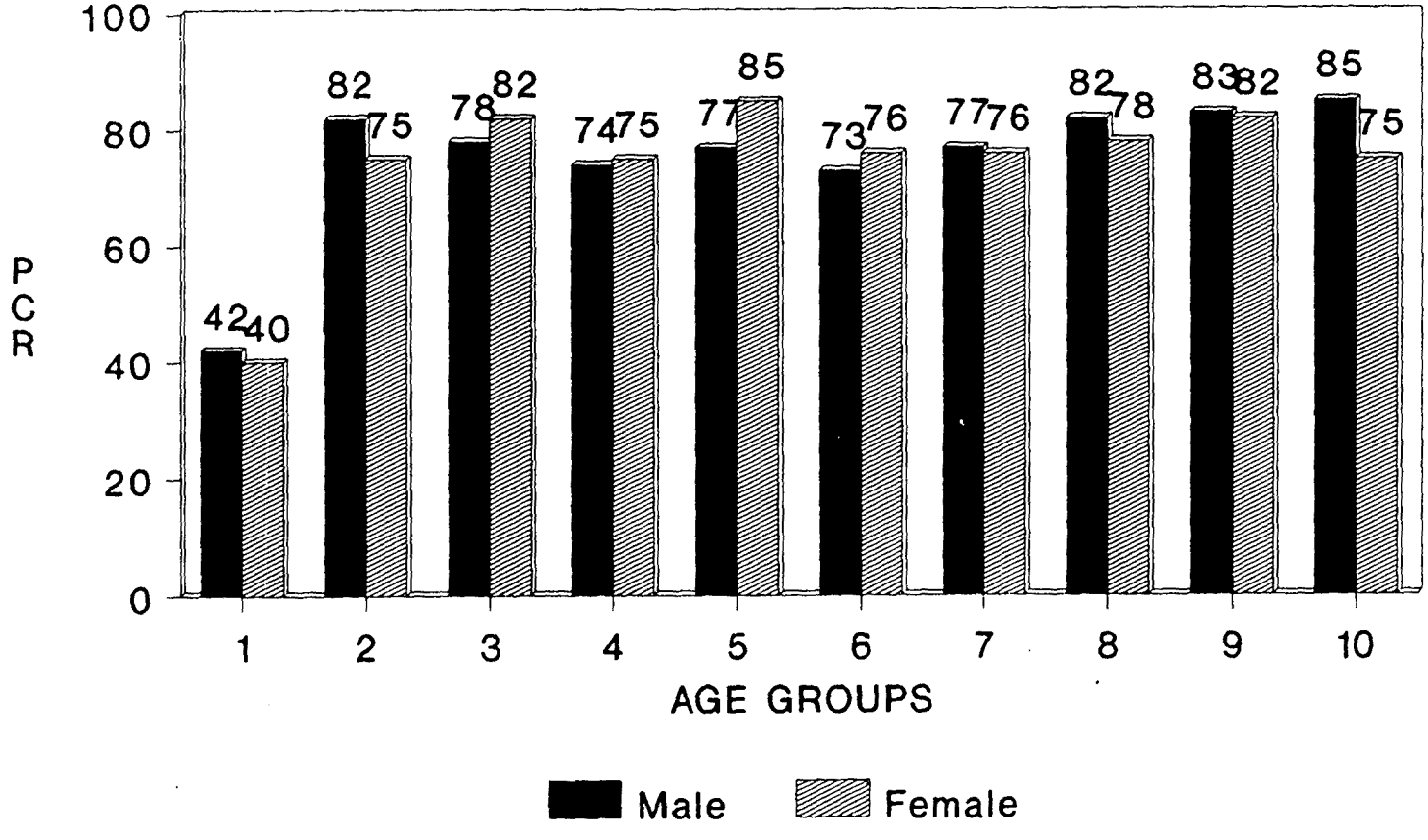
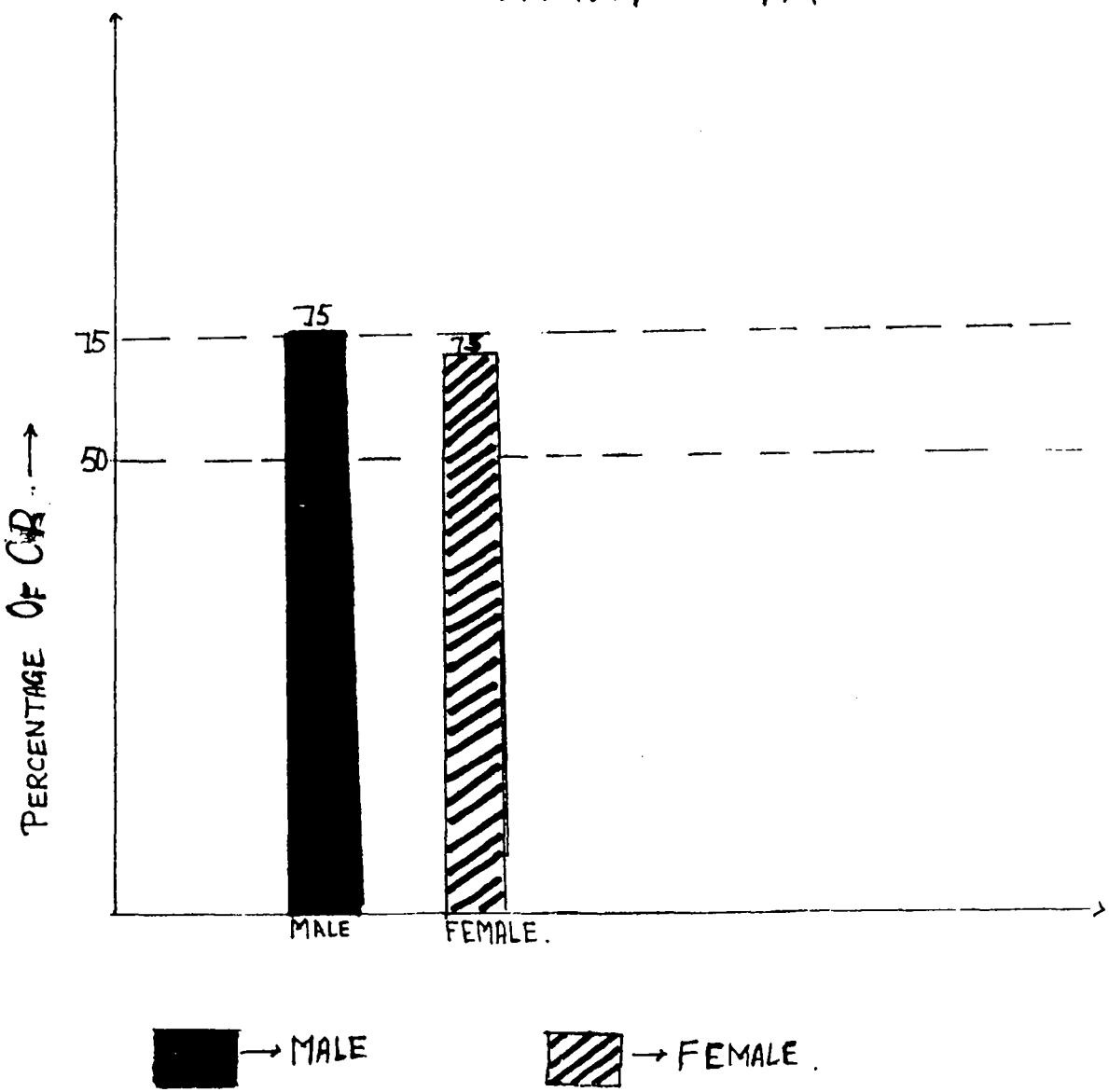


CHART - 9A



The chart indicates that children from LMC have a lower percentage of correct responses as compared to the UMC children till group 7 (i.e. age-group 3;3 - 3;6). In group 8, we find a change in the percentage of correct response. The percentage of correct responses for LMC children is higher as compared to the UMC children i.e. 85% as against 78%. In group 9, this trend is continued and percentage of correct response for total LMC children is 85% while for UMC children it is 80%. In group 10, the percentage of correct response is 84% for LMC and 76% for UMC. This, is perhaps due to the exposure to the school environment for the LMC children which begins only at 3 years and 6 months. LMC children tend to learn faster when they start going to school. We plotted a separate bar-graph to see the difference in percentage of acquisition before group 8 i.e. before LMC children start going to school and after they are in the school environment. (chart 10.A).

The percentage form group 1 to group 7 indicates that the correct response for LMC children is 67% while correct response for UMC children is 76%. The difference is noted in the later three groups i.e. groups 8, 9 and 10. The percentage for LMC is 85% while for UMC children acquisition is 78%. A much more detailed study will be required to ascertain the exact impact of schooling on different aspects of language/speech development of children coming from

CHART 10: CLASSWISE DISTRIBUTION SHOWING UMC VS. LMC CORRECT RESPONSE IN %AGE

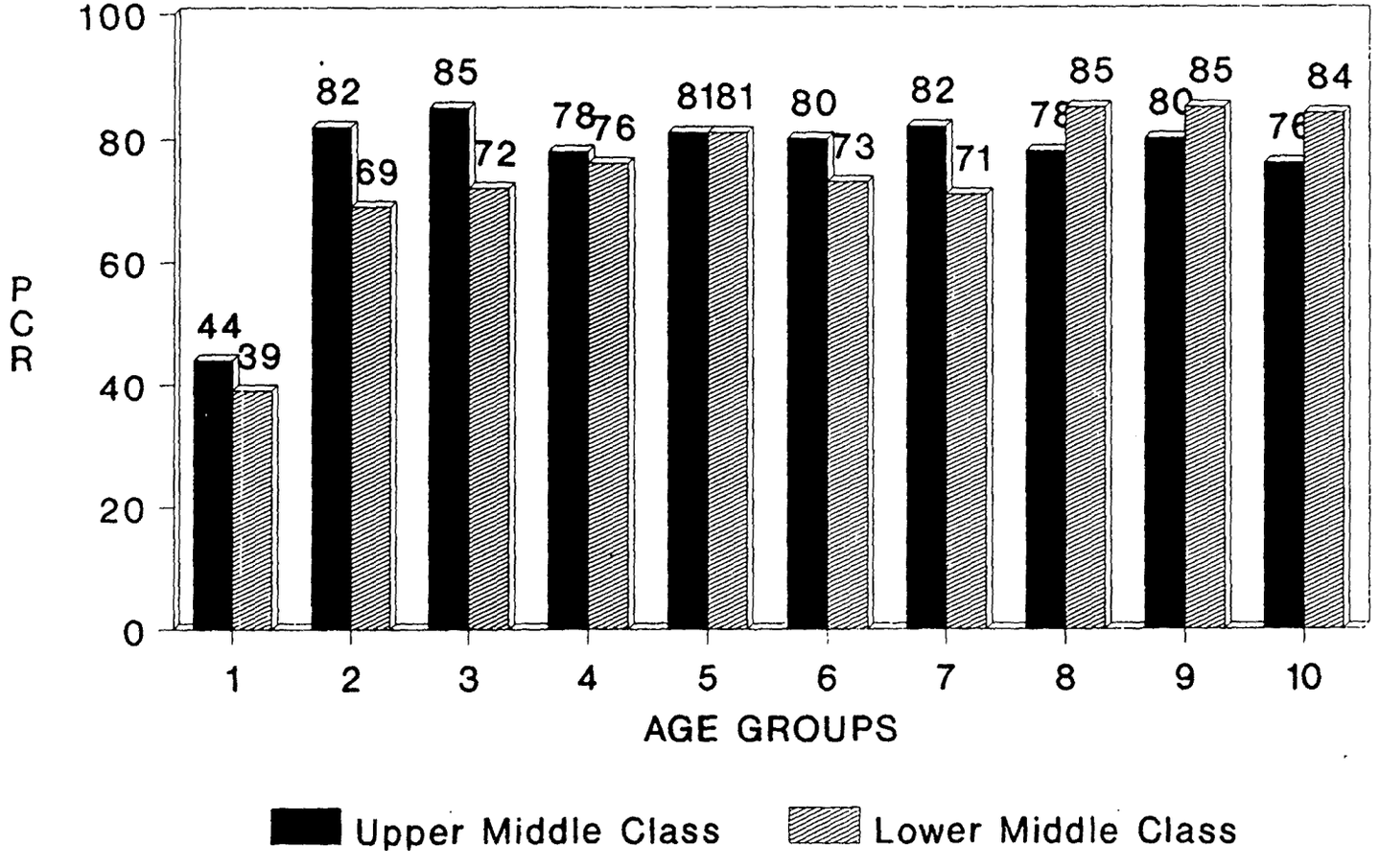
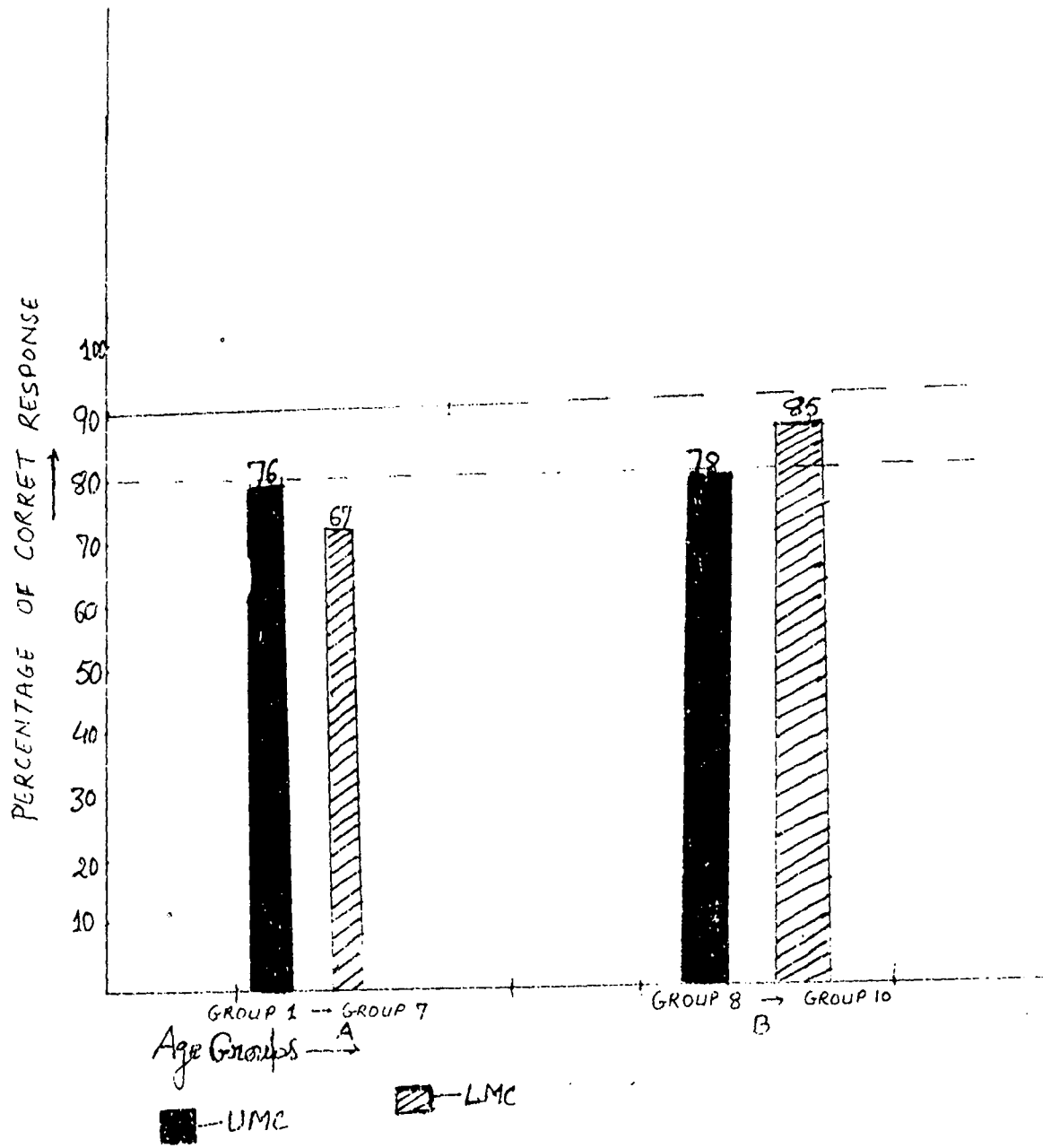


CHART - 10A


PERCENTAGE OF CORRET RESPONSE
100
90
80
70
60
50
40
30
20
10
76
67
78
85
GROUP 1 → GROUP 7
A
GROUP 8 → GROUP 10
B
Age Groups →
UMC
LMC

different social classes, a very tentative conclusion that can be drawn from this data is that children from LMC indicate increase in correct response after their exposure to the school environment.

Chart No.11: Correct Responses (all sounds) Against the Variables - Age, Sex and Class.

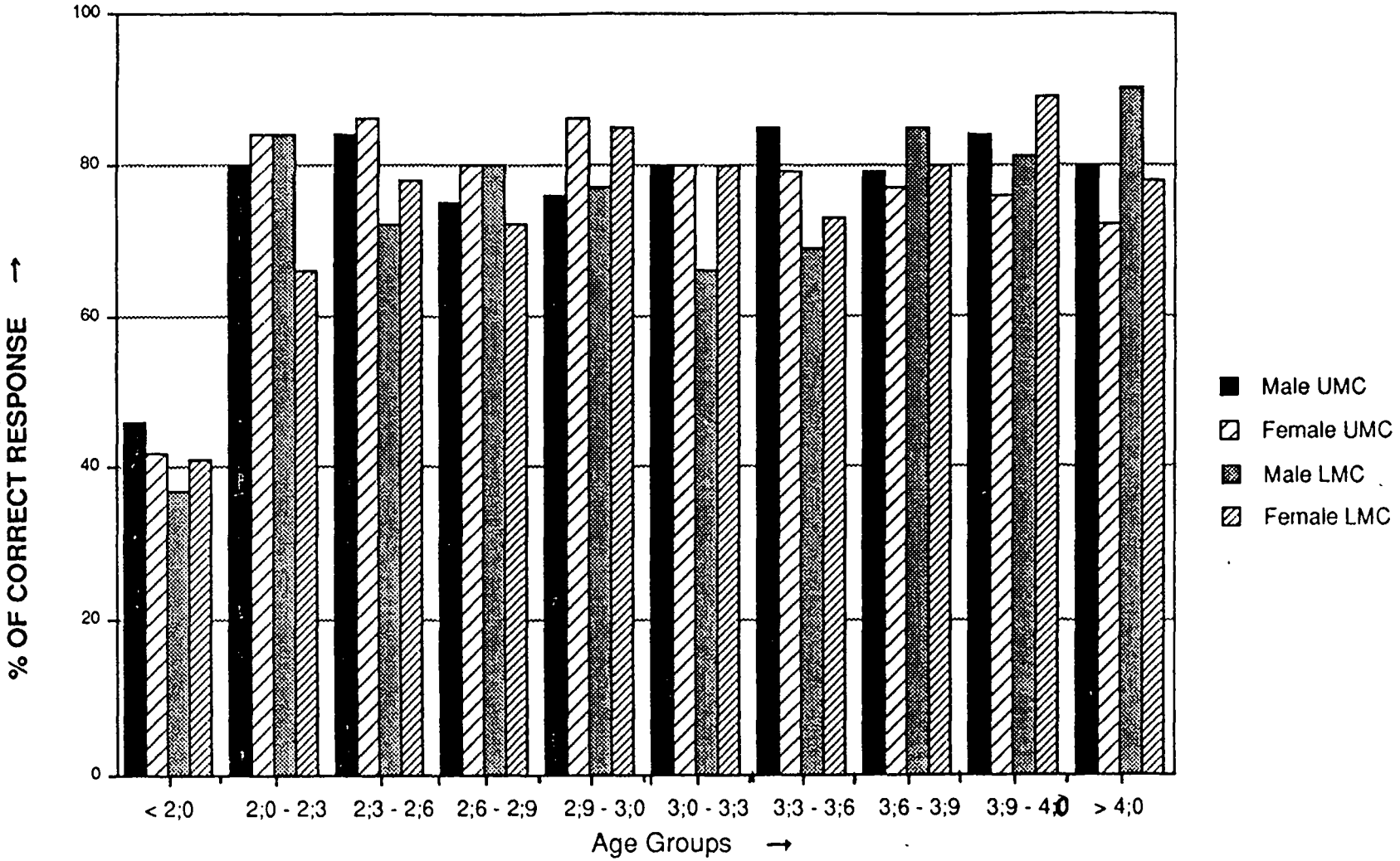
The chart (page 57A) indicates the percentage of correct response of different classes of speech sounds plotted against all the three variables: age, sex and class of the subjects.

The results obtained from chart 11 are presented in the following form:

(showing the acquisition in term of the percentage of correct responses):

SERIAL NO.	AGE-GROUPS (in years; months)	UPPER MIDDLE CLASS		LOWER MIDDLE CLASS	
		MALE	FEMALE	MALE	FEMALE
1.	below 2;0	46	42	37	41
2.	2;0 - 2;3	80	84	84	66*
3.	2;3 - 2;6	84	86	72	78*
4.	2;6 - 2;9	75	80*	80	72
5.	2;9 - 3;0	76	86*	77	85*
6.	3;0 - 3;3	80	80	66	80*
7.	3;3 - 3;6	85	79*	69	73
8.	3;6 - 3;9	79	77	85	80*
9.	3;9 - 4;0	84	76*	81	89*
10.	above 4;0	80	72*	90	78*

CHART 11
UPPER MIDDLE CLASS (MALE AND FEMALE) AND LOWER MIDDLE CLASS (MALEAND FEMALE) CORRECT RESPONSE OF ALL SOUNDS



On the basis of the above results we can see the percentage of correct response by the male-female children against the variable of class. The difference of percentage by 3% or 4% seems to be statistically insignificant. So the differences marked with astrix mark (*) are examined more closely.

The results indicate that correct response for male and female in group 2 (for LMC) has a difference of 18% (i.e. 84% for male, 66% for female). The number of subjects were equal for both male and female, that is 2 subjects for each category. Since the number of subjects is small, this might be the reason for the difference in percentage. The female subjects taken in this group (group 2) have more substitution than the male subjects. The exact nature of the correlation can only be ascertained by taking more children of this age-group.

Similarly in group 3, the difference of percentage for correct response between male and female subjects (LMC) is 6% (i.e. 72% for male and 78% for female). In this group too, the number of subjects are equal (2 male and 2 female). Substitutions are more in the data by the male subjects in this group. The number of children in each one of the groups is so small that even a tentative conclusion could

not be drawn on the basis of these three age groups above. In group 4, the difference in percentage of correct response between male and female subjects (UMC) is of 5%. This insignificant difference is perhaps due to the unequal number of male-female subjects in this group. Male subjects were 4 while female was only one. In group 5, too, the difference in percentage of correct response between male and female (UMC) children is 10% and this may also be due to the unequal distribution of the male-female ratio (i.e. 5:2). In group 5, the difference of percentage of correct response (8%) between male-female (in the LMC) again can not lead to any conclusion because of the unequal distribution of male-female ratio (5:1) in this class.

In group 6, correct response for male and female (LMC) has a difference of 14%. This data seems to be more reliable as the number of male and female subjects is identical i.e. 3 each. Substitution by male children are more as compared to the female children.

In group 7, the difference in percentage for the UMC male and female is of 6%. The number of subjects were: 4 males and 5 females. The substitutions were found more in the female speech of the UMC. The correct response between male-female of LMC in this group has 4% of difference, which is statistically insignificant.

In group 8, the difference in percentage of correct responses between male and female subjects (LMC) is of 6%. This again can not lead us to any conclusion because of the unequal distribution of the male-female ratio (i.e. 1:3). The LMC children have the difference of only 2%. In group 9, the difference in the percentage of correct response in LMC is of 8% and this may be due to the unequal number of male-female subjects in this group for LMC (i.e., 5 males and 2 females). In the same group, the differnce in correct response between male and female subjects is of 8%. The male-female ratio is 3:4. Substitution were more by the female subjects in this group.

In group 10, the difference in percentage in UMC male and female subjects is 8%. The number of children of this group was 2 males and 2 females. Substitution by female subjects were more as compared to male children. Although the number of children in this group is just 2+2 it is not enough to make any conclusive statement, except, when put together with the LMC in the same group. The differnce in percentage (LMC) between male and female subjects is 12%. The number of subjects in this group were 5 males and 3 females. The substitution by the female subjects was more as compare to the male subjects.

We can say that children from the lower middle class tend to do better in age-groups 8, 9 and 10, that is after some exposure to school environment.

Male children acquire faster in the later age-groups in both LMC and UMC as compared to the female children. In earlier groups especially in groups 1, 4 and 5, nothing can be said in the acquisition rate of male and female children because of an unequal number of males and females in these groups.

Chart 12.1 to 12.10

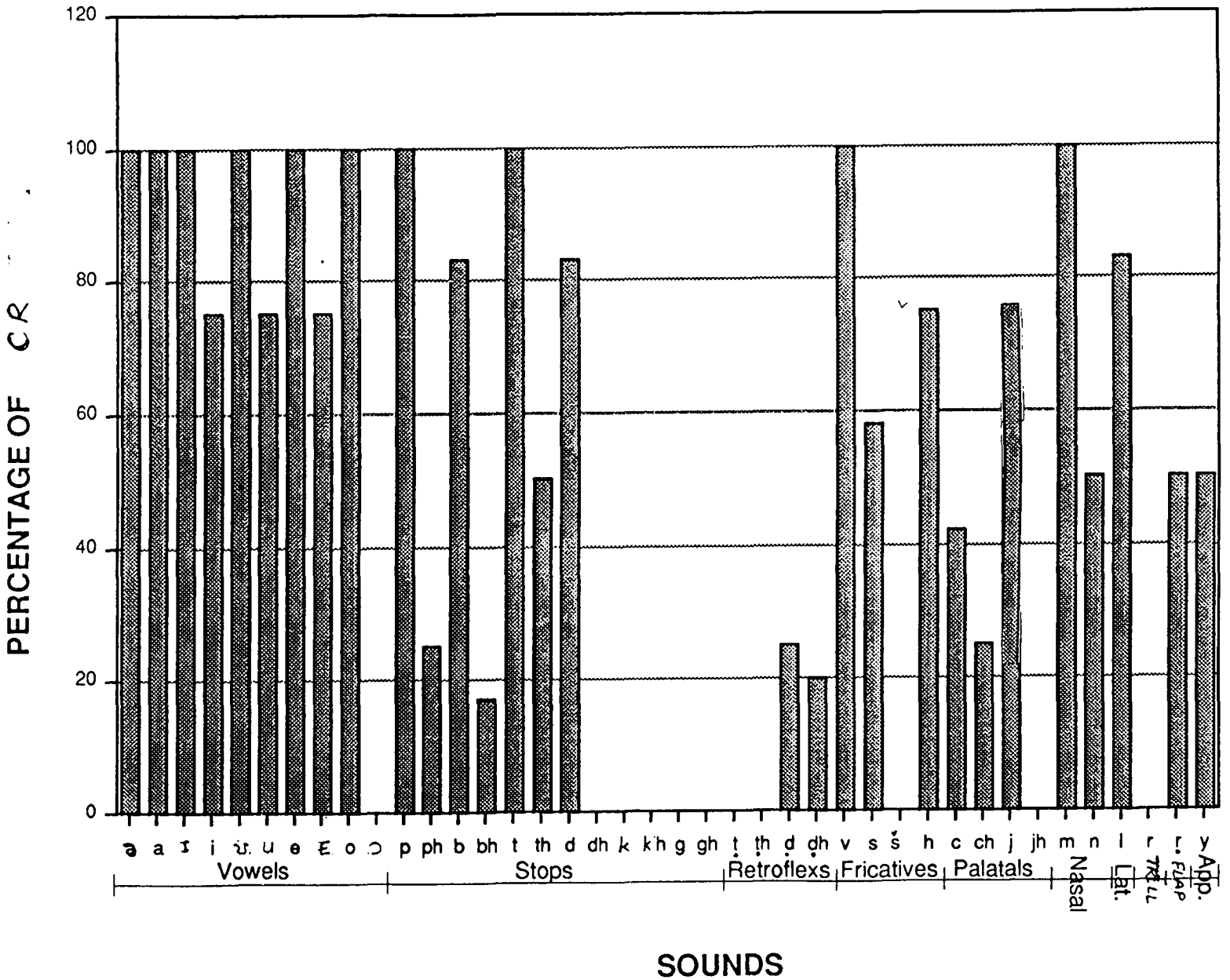
The charts (12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 12.10) on pages 62 to 81), indicate the percentage of sounds acquired in different age-groups with all the sounds tested.

These charts (12.1 to 12.10) are for the 10 age-groups in our study. Each chart has the percentage of correct response and all the sounds plotted by means of bar-charts. A general trend is shown by these charts. A detailed discussion is followed after each chart.

What is not plotted are the partially incorrect response and the partially correct sounds.

CHART 12 . 1

BELOW 2 YEARS

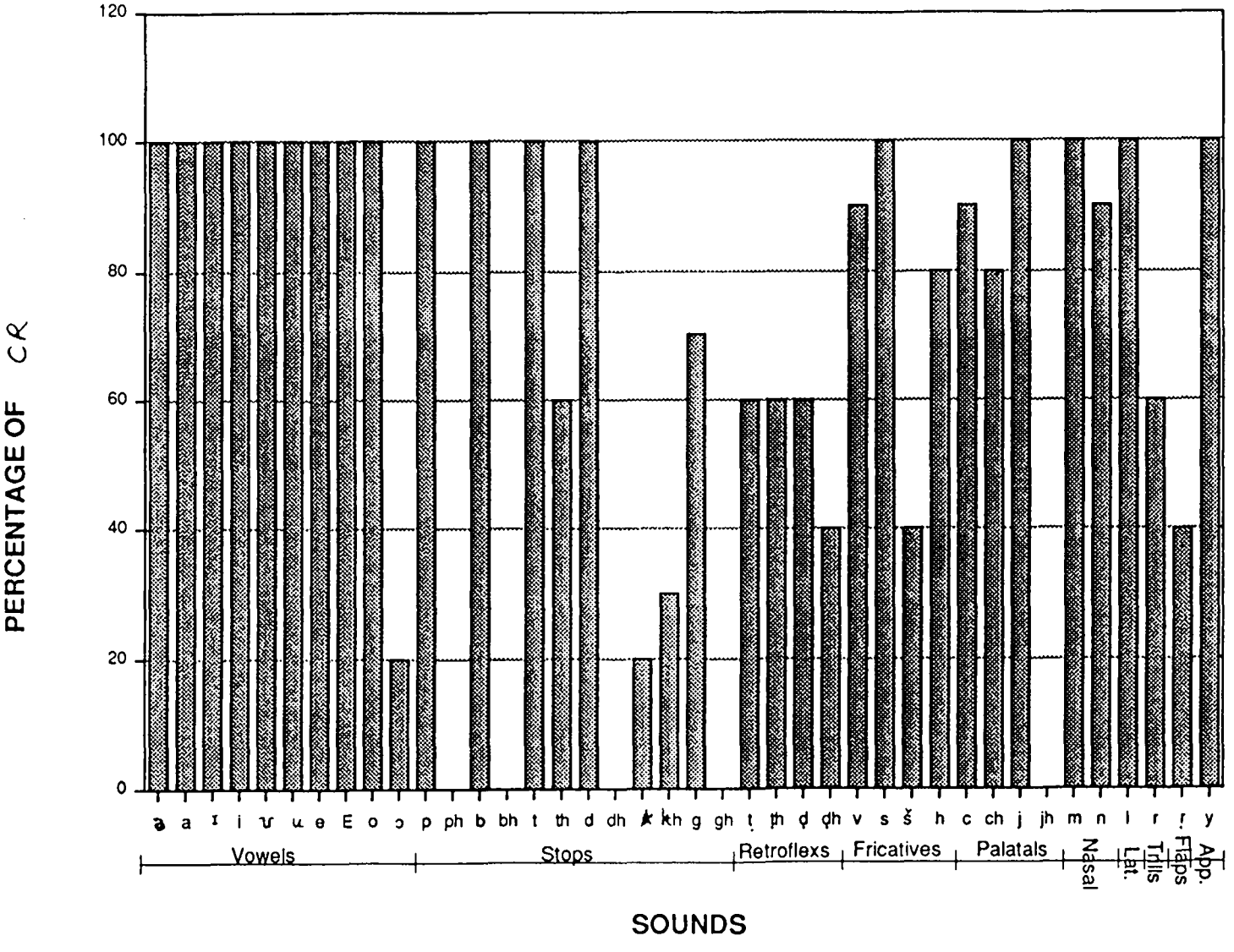


DESCRIPTION OF CHART NO. 12·1

Chart No. 12·1 Shows the PCR for all the sounds by children from age-group One years and nine months to 2 years and 3 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ə/	100	/a/	100
/I/	100	/i/	75
/ʊ/	100	/u/	75
/e/	100	/E/	75
/o/	100	/ɔ/	NIL
/p/	100	/ph/	25
/b/	83	/bh/	17
/t/	100	/th/	50
/d/	83	/dh/	NIL
/ṭ/	NIL	/ṭh/	NIL
/ḍ/	25	/ḍh/	20
/k/	NIL	/kh/	NIL
/g/	NIL	/gh/	NIL
/c/	42	/ch/	25
/j/	75	/jh/	NIL
/v/	100	/s/	58
/š/	NIL	/h/	75
/m/	100	/n/	50
/l/	83	/r/	NIL
/ṛ/	50	/y/	50

CHART 12·2

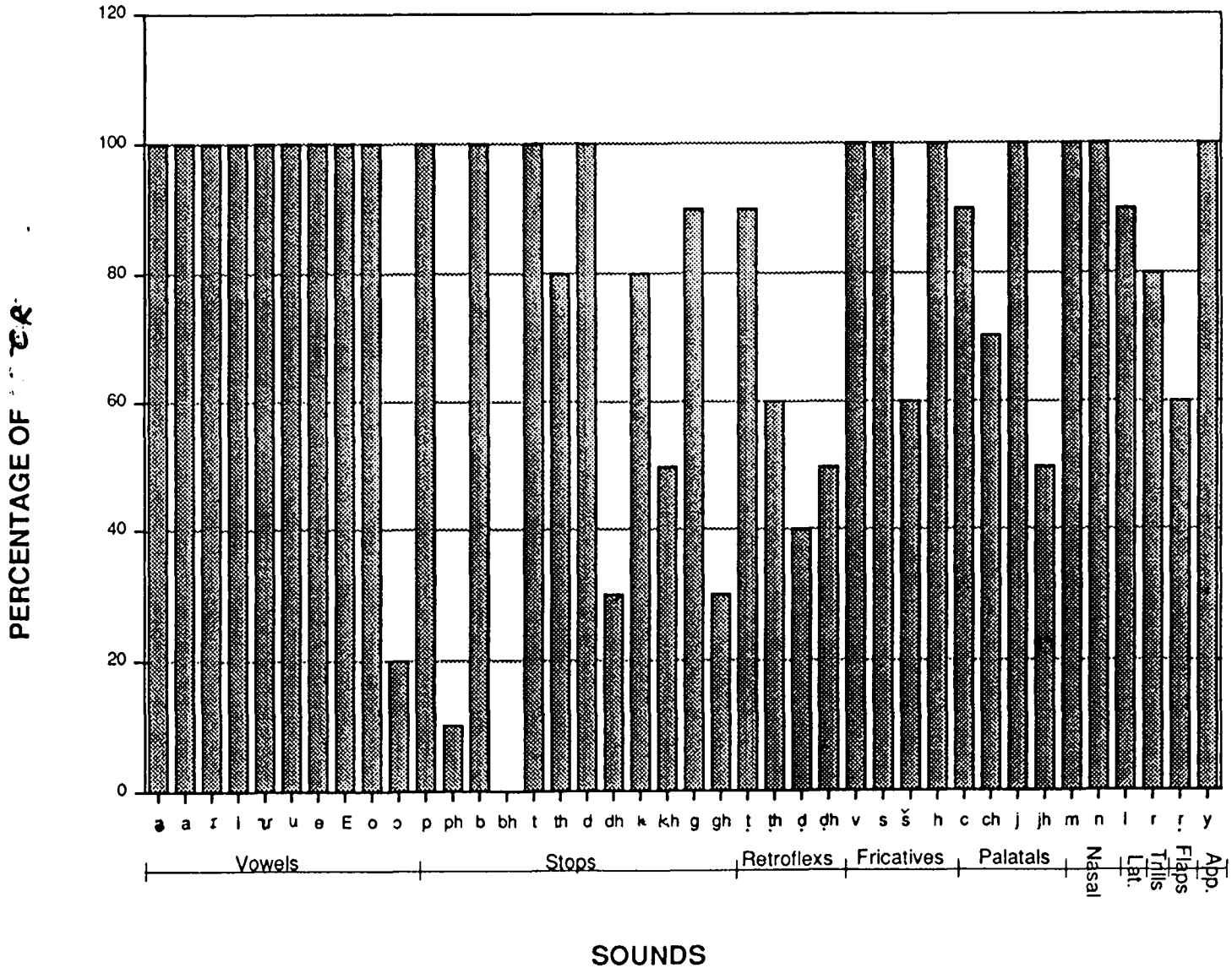

120
100
80
60
40
20
0
PERCENTAGE OF CR
ə a ɪ i ʊ u e E o ɔ p ph b bh t th d dh ʈ ʈh g gh ʈ ʈh ɖ ɖh v s š h c ch j jh m n l r ɾ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12.2

Chart No. 12.2 Shows the PCR for all the sounds by children from age-group 2 years and 3 months to 2 years and 6 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ə/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	20
/p/	100	/ph/	NIL
/b/	100	/bh/	NIL
/t/	100	/th/	60
/d/	100	/dh/	NIL
/ṭ/	60	/ṭh/	60
/ḍ/	60	/ḍh/	20
/k/	20	/kh/	30
/g/	70	/gh/	NIL
/c/	90	/ch/	80
/j/	100	/jh/	NIL
/v/	90	/s/	100
/š/	40	/h/	80
/m/	100	/n/	90
/l/	100	/r/	60
/ṛ/	40	/y/	100

CHART 12·3

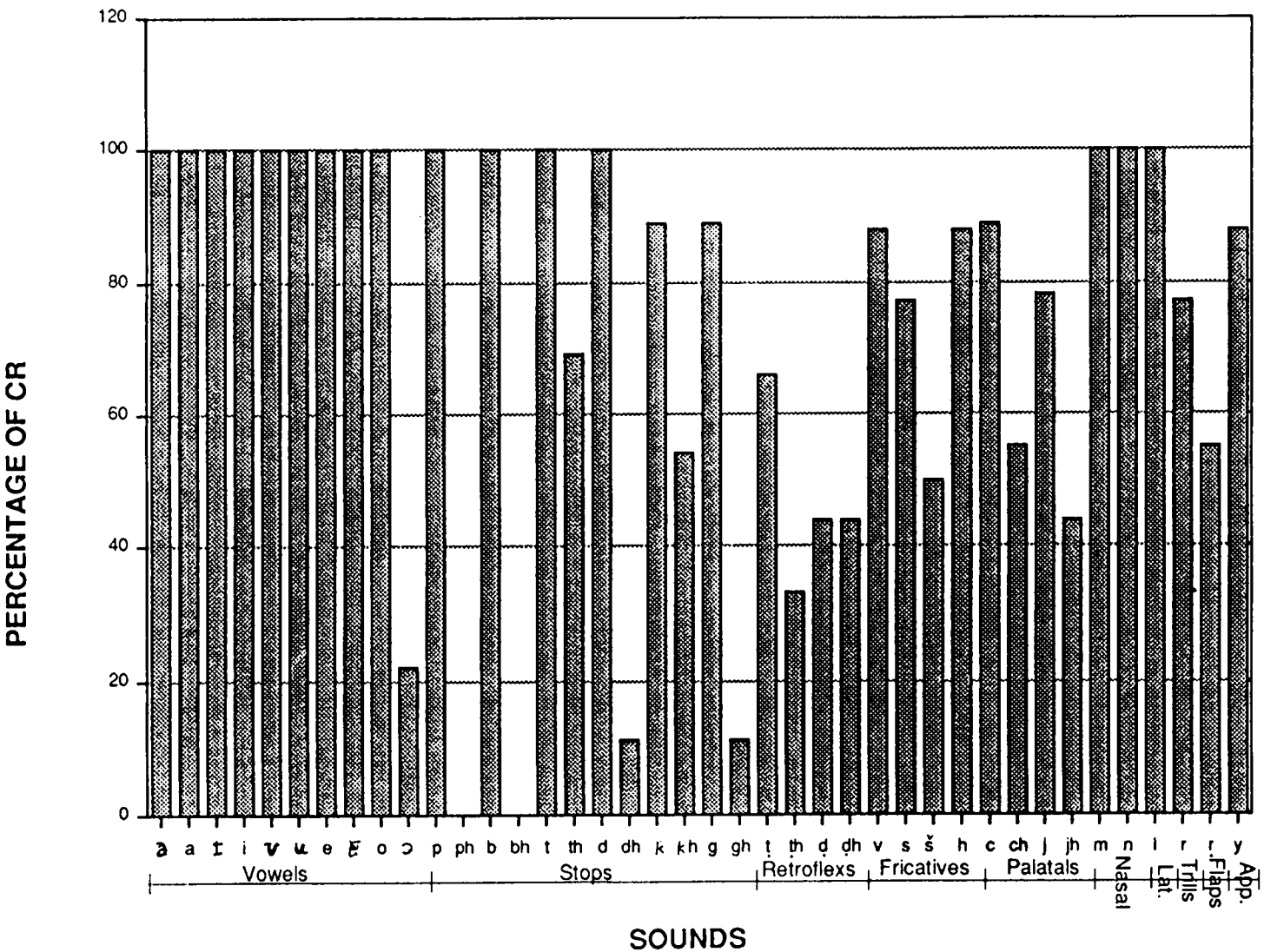

120
100
80
60
40
20
0
PERCENTAGE OF
ə a ɪ i ʊ u e E o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·3

Chart No. 12·3 Shows the PCR for all the sounds by children from age-group 2 years and 3 months to 2 years and 6 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ɔ/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	20
/p/	100	/ph/	10
/b/	100	/bh/	NIL
/t/	100	/th/	80
/d/	100	/dh/	30
/ṭ/	90	/ṭh/	60
/ḍ/	40	/ḍh/	50
/k/	80	/kh/	50
/g/	90	/gh/	30
/c/	90	/ch/	70
/j/	100	/jh/	50
/v/	100	/s/	100
/s̆/	60	/h/	100
/m/	100	/n/	100
/l/	90	/r/	80
/ṛ/	60	/y/	100

CHART NO. 12.4

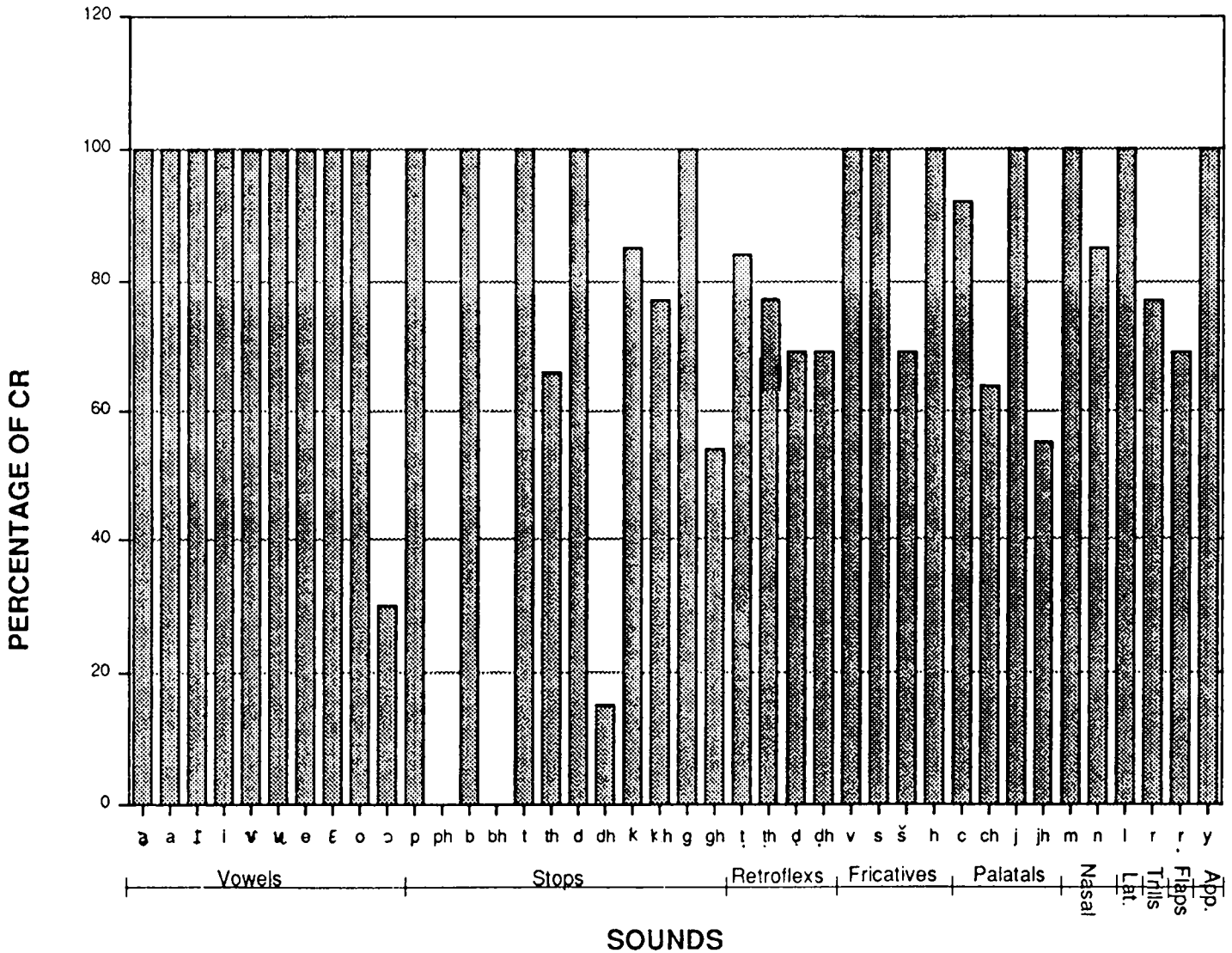

PERCENTAGE OF CR
120
100
80
60
40
20
0
ə a ɪ i ʊ ɯ e ɛ o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·4

Chart No. 12·4 Shows the PCR for all the sounds by children from age-group 2 years and 6 months to 2 years and 9 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ɔ/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	22
/p/	100	/ph/	NIL
/b/	100	/bh/	NIL
/t/	100	/th/	69
/d/	100	/dh/	11
/ṭ/	66	/ṭh/	33
/ḍ/	44	/ḍh/	44
/k/	89	/kh/	54
/g/	89	/gh/	11
/c/	89	/ch/	55
/j/	78	/jh/	44
/v/	88	/s/	77
/š/	50	/h/	88
/m/	100	/n/	100
/l/	100	/r/	77
/ṛ/	55	/y/	88

CHART NO. 12.5

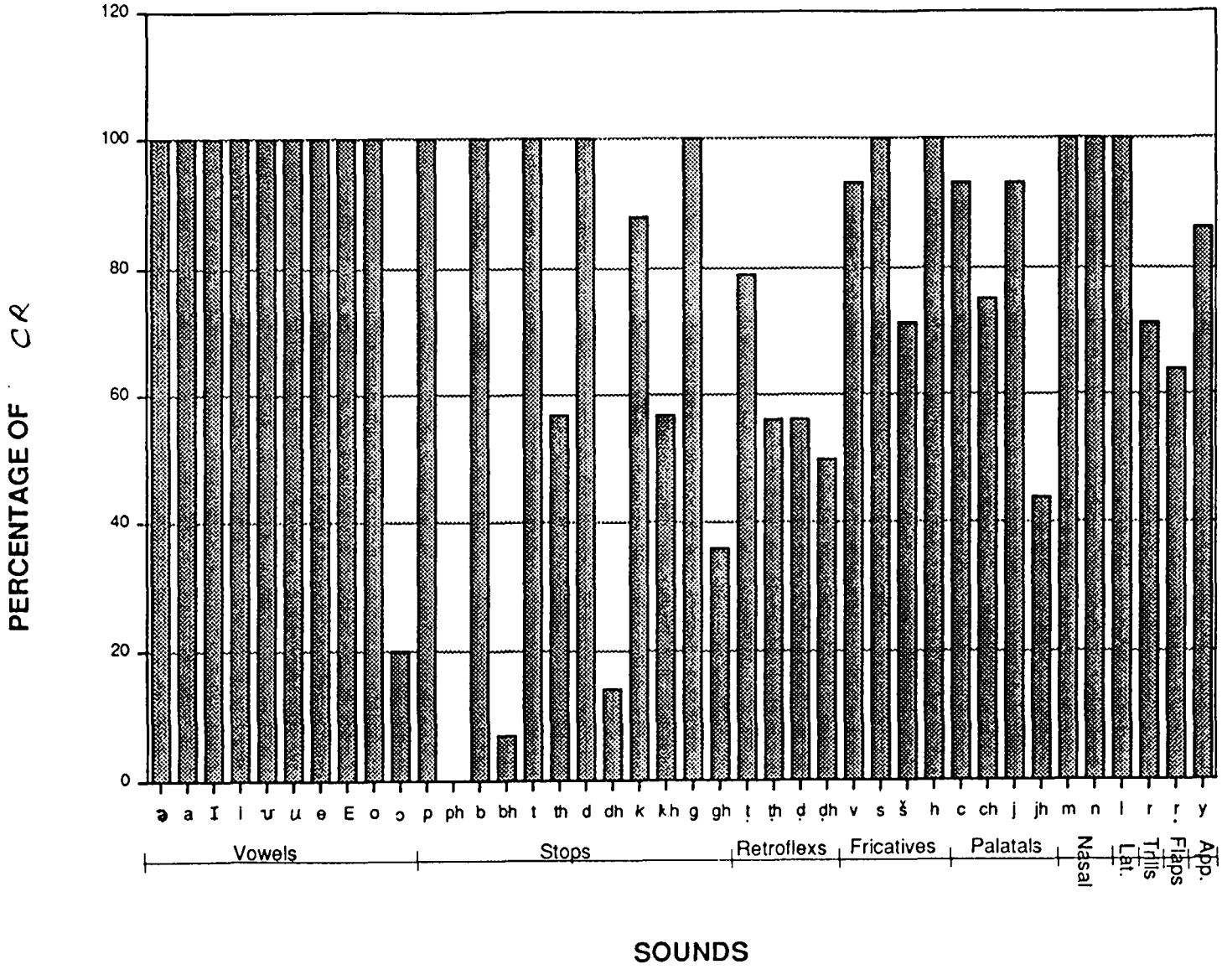

PERCENTAGE OF CR
120
100
80
60
40
20
0
ə a ɪ i ʊ u e ɛ o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·5

Chart No. 12·5 Shows the PCR for all the sounds by children from age-group 2 years and 9 months to 3 years and 0 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ɔ/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	30
/p/	100	/ph/	NIL
/b/	100	/bh/	NIL
/t/	100	/th/	67
/d/	100	/dh/	15
/ṭ/	84	/ṭh/	77
/ḍ/	69	/ḍh/	69
/k/	85	/kh/	77
/g/	100	/gh/	54
/c/	92	/ch/	64
/j/	100	/jh/	55
/v/	100	/s/	100
/š/	69	/h/	100
/m/	100	/n/	85
/l/	100	/r/	77
/ṛ/	69	/y/	100

CHART - 12·6

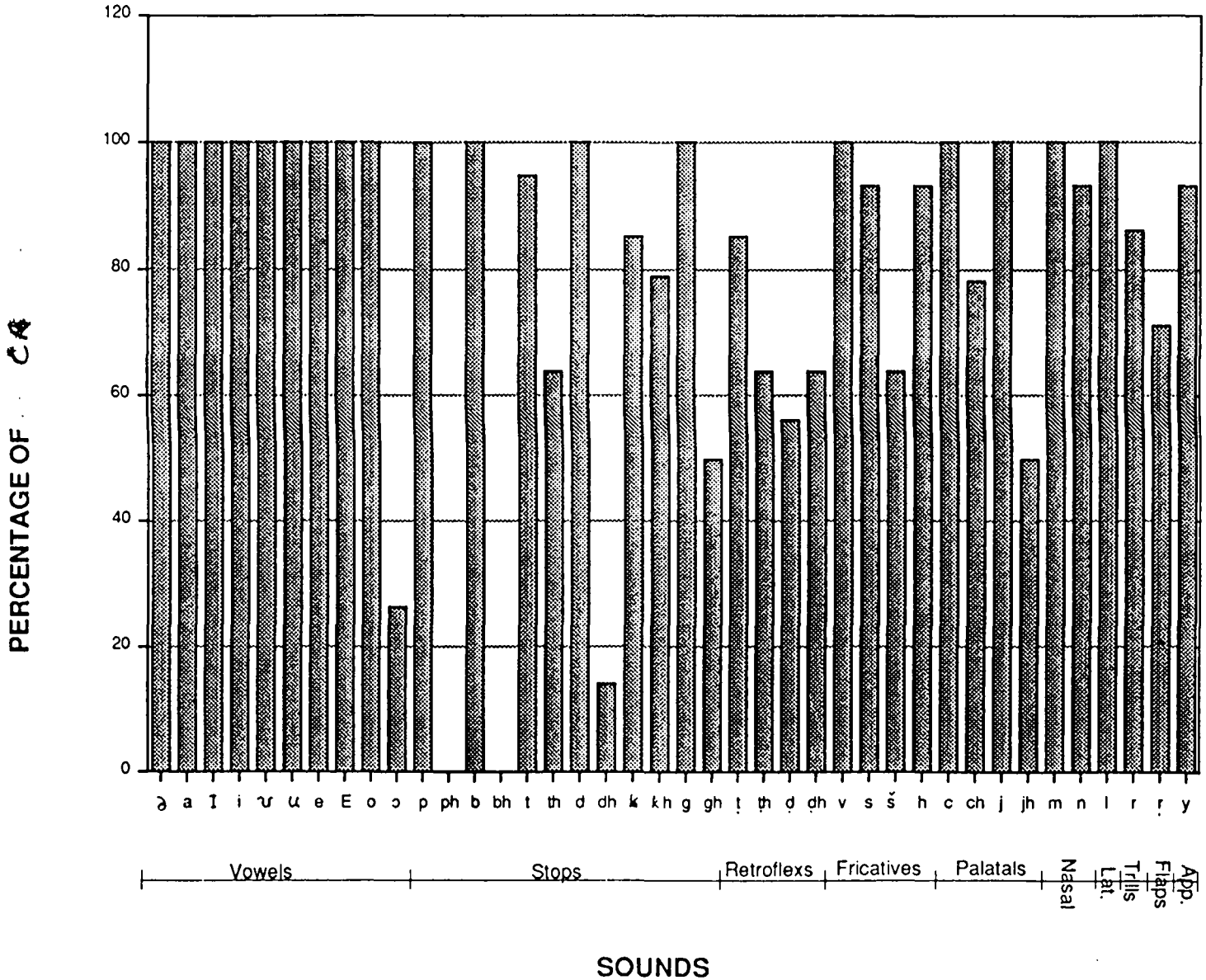

120
100
80
60
40
20
0
PERCENTAGE OF CR
ə a I i ʊ u e E o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·6

Chart No. 12·6 Shows the PCR for all the sounds by children from age-group 3 years and 0 months to 3 years and 3 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ə/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	20
/p/	100	/ph/	NIL
/b/	100	/bh/	7
/t/	100	/th/	57
/d/	100	/dh/	14
/ṭ/	79	/ṭh/	56
/ḍ/	56	/ḍh/	50
/k/	88	/kh/	57
/g/	100	/gh/	36
/c/	93	/ch/	75
/j/	95	/jh/	44
/v/	93	/s/	100
/š/	71	/h/	100
/m/	100	/n/	100
/l/	100	/r/	71
/ṛ/	64	/y/	86

CHART 12.7

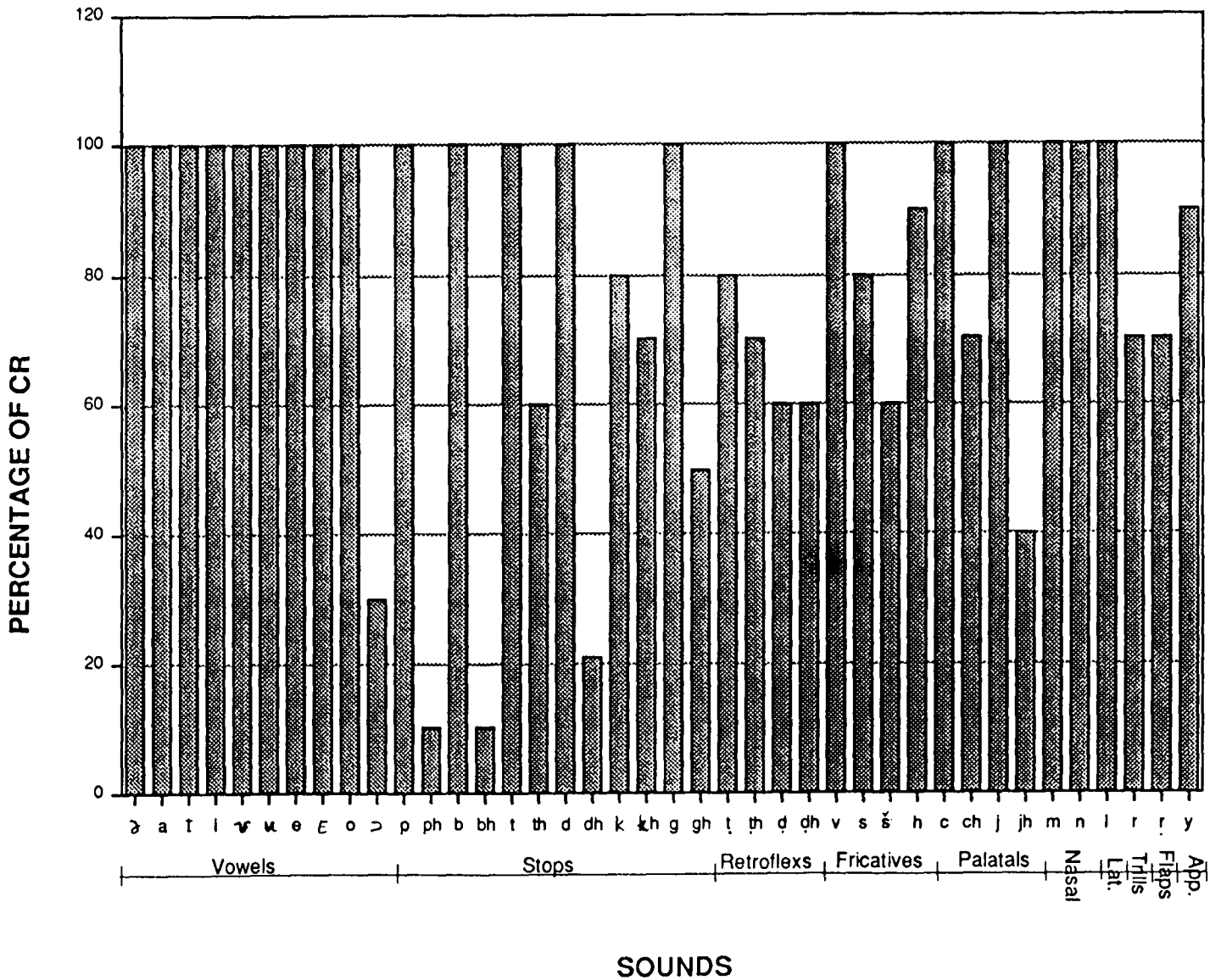

PERCENTAGE OF
120
100
80
60
40
20
0
ə a ɪ i ʊ u e E o ɔ p ph b bh t th d dh ʈ ʈh g gh ʈ ʈh ɖ ɖh v s š h c ch j jh m n l r ɾ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·7

Chart No. 12·7 Shows the PCR for all the sounds by children from age-group 3 years and 3 months to 3 years and 6 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ə/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	26
/p/	100	/ph/	NIL
/b/	100	/bh/	NIL
/t/	95	/th/	64
/d/	100	/dh/	14
/ṭ/	85	/ṭh/	64
/ḍ/	56	/ḍh/	64
/k/	85	/kh/	79
/g/	100	/gh/	50
/c/	100	/ch/	78
/j/	100	/jh/	50
/v/	100	/s/	93
/š/	64	/h/	93
/m/	100	/n/	93
/l/	100	/r/	86
/ṛ/	71	/y/	93

CHART NO. .12.8

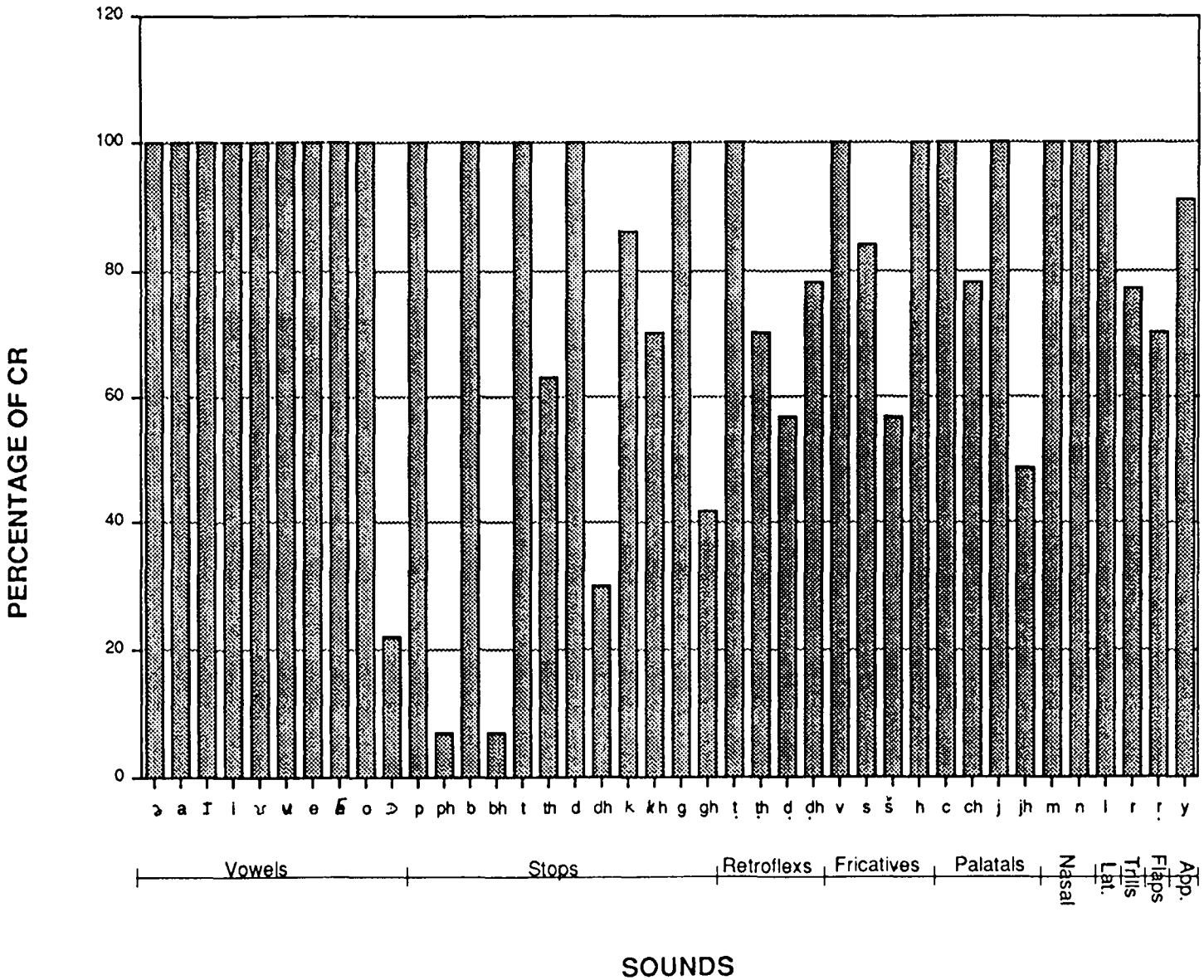

PERCENTAGE OF CR
120
100
80
60
40
20
0
ə a ɪ i ʊ u e ɛ o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·8

Chart No. 12·8 Shows the PCR for all the sounds by children from age-group 3 years and 6 months to 3 years and 9 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ɔ/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	30
/p/	100	/ph/	10
/b/	100	/bh/	10
/t/	100	/th/	60
/d/	100	/dh/	21
/ṭ/	80	/ṭh/	70
/ḍ/	60	/ḍh/	60
/k/	80	/kh/	70
/g/	100	/gh/	50
/c/	100	/ch/	70
/j/	100	/jh/	40
/v/	100	/s/	80
/š/	60	/h/	90
/m/	100	/n/	100
/l/	100	/r/	70
/ṛ/	70	/y/	90

CHART NO. 12.9

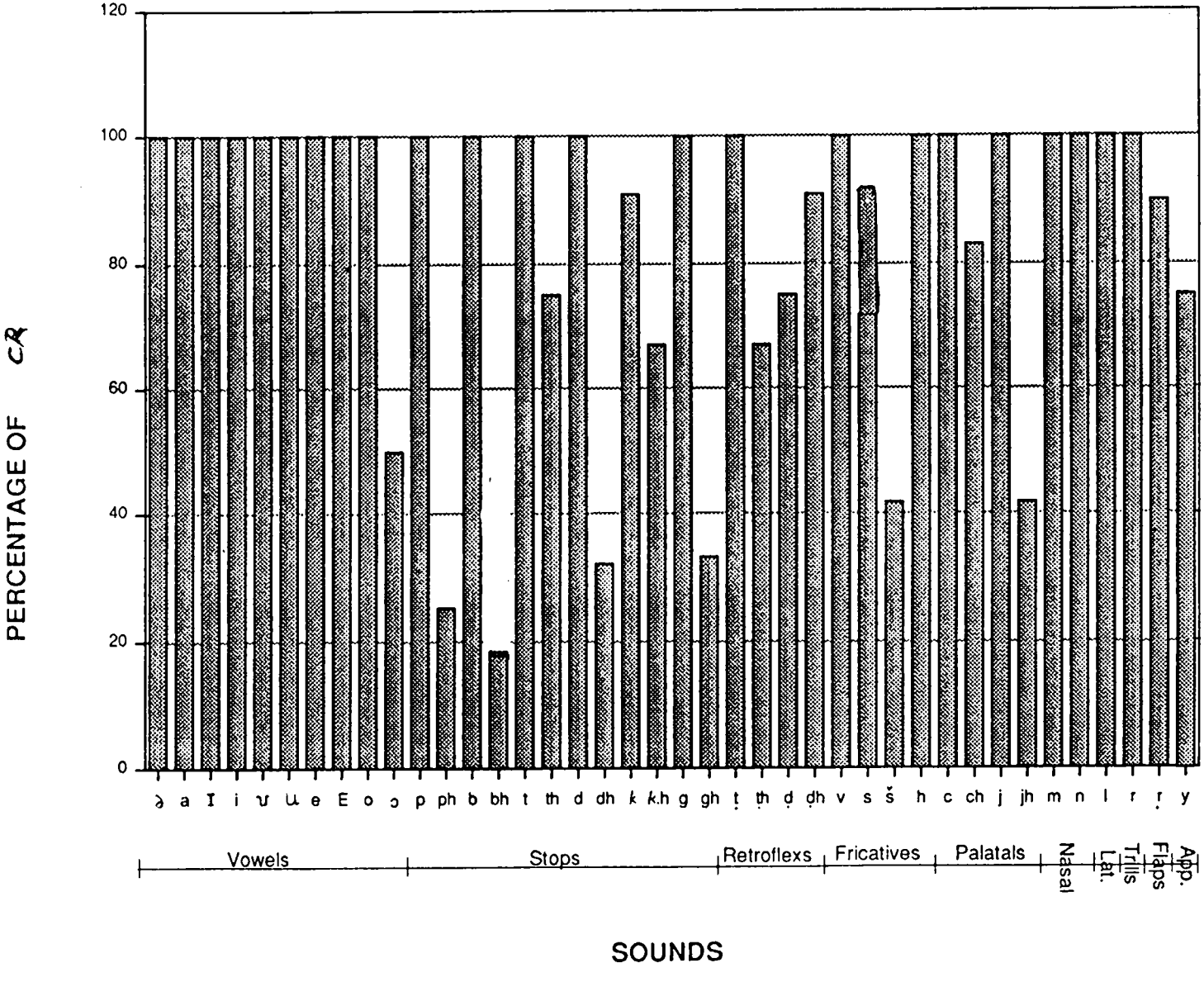

120
100
80
60
40
20
0
PERCENTAGE OF CR
ə a ɪ i ʊ u e ɛ o ɔ p ph b bh t th d dh k kh g gh ṭ ṭh ḍ ḍh v s š h c ch j jh m n l r ṛ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·9

Chart No. 12·9 Shows the PCR for all the sounds by children from age-group 3 years and 9 months to 4 years and 0 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ə/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	22
/p/	100	/ph/	07
/b/	100	/bh/	07
/t/	100	/th/	63
/d/	100	/dh/	30
/ṭ/	100	/ṭh/	70
/ḍ/	57	/ḍh/	78
/k/	86	/kh/	70
/g/	100	/gh/	42
/c/	100	/ch/	78
/j/	100	/jh/	49
/v/	100	/s/	84
/š/	57	/h/	100
/m/	100	/n/	100
/l/	100	/r/	77
/ṛ/	70	/y/	91

CHART 12.10


120
100
80
60
40
20
0
PERCENTAGE OF CR
ə a ɪ i ʊ ɯ e E o ɔ p ph b bh t th d dh k k.h g gh ʈ ʈh ɖ ɖh v s š h c ch j jh m n l r ɾ y
Vowels
Stops
Retroflexs
Fricatives
Palatals
Nasal
Lat.
Trills
Flaps
App.
SOUNDS

DESCRIPTION OF CHART NO. 12·10

Chart No. 12·10 Shows the PCR for all the sounds by children from age-group 4 years and 0 months to 4 years and 4 months. The PCR for each sounds can be summarised as follows:-

Sounds	PCR	Sounds	PCR
/ɔ/	100	/a/	100
/I/	100	/i/	100
/ʊ/	100	/u/	100
/e/	100	/E/	100
/o/	100	/ɔ/	50
/p/	100	/ph/	25
/b/	100	/bh/	17
/ṭ/	100	/th/	75
/d/	100	/dh/	32
/ṭ/	100	/ṭh/	67
/ḍ/	75	/ḍh/	91
/k/	91	/kh/	67
/g/	100	/gh/	33
/c/	100	/ch/	83
/j/	100	/jh/	42
/v/	100	/s/	92
/š/	42	/h/	100
/m/	100	/n/	100
/l/	100	/r/	100
/ṛ/	90	/y/	75

For each one of the sounds the responses is discussed in the following pages.In comparing some of the sounds across different age groups it was found that no linear correlation was found, but clubling togather certain age groups, for instance, A as group 1 and group 2 (below 2 years to 2 years and 3 months)

B as groups 3,4,5 and 6 (2 years and 3 months to 3 years and 3 months)

C as group 7,8,9 and 10 (3 years and 3 months to 4 years and 4 months),

gave definite clues to the acquisition of sounds under this study.

VOWELS

Charts (12.1 - 12.10) indicate that the percentage of acquisition of vowels in very high. The vowels /ə/ /ɑ/ /I/ /i/ /ʊ/ /u/ /e/ /E/ and /o/ have 100% acquisition in all age-groups except group 1 (i.e. below 2 years), the correct response for vowels /i/ /u/ and /E/ is 75% each in group 1. The incorrect response is around 25% for each of these three vowels. Most of the incorrect responses are in the initial position. The substitution for the long vowels is with the corresponding short vowels.

Except vowel /ɔ/ all the vowels do figure in the child's speech but their features show the influence of both the languages - Hindi and Punjabi. All these children do know all these vowels, but in cognates like the following:

/dãt/ - /dɔnd/

/kam/ - /kɔmm/

/sikhna/ - /sIkhna/

/iṭ/ - /IṭṭI/

/ʊṭ/ - /ʊṭṭ (ɔ) /

/ʊca/ - /ʊcca/

Were the long vowel of Hindi corresponds to the short vowel + geminate of Punjabi, indicates the occurrence of both the words in the child's repertoire. So, some of the substitutions of long vowels in the test word by short vowel in the child's response can be attributed to this fact.

We can say that the substitutions occurring for these vowels are not an indication of what the child has or has not acquired. A child, when acquires two different sounds for the same word at home and outside knows both the sounds but does not know the exact distribution of the two, thus resulting in inconsistent responses.

NOTES

1. The total of the first three columns, (I, M and F) and; IMF and correct response when added do not add up to 100% because (a) first three columns I,M,F indicates partial acquisitin (b) "incorrect in all IMF" column indicates no acquisition and (c) "all correct responses" indicates correct acquisition.

2. There is an overlap in the first three columns (I,M,F) as some children responded to either one-third position (i.e., either I or M or F) or to two thirds position (i.e., either I-M or M-F or I-F) or to all the three test words i.e., I-M and F positions.

P.T.O

Vowels /ɔ/

Vowel /ɔ/ is perceived as an allophonic variant of the vowel /o/ by most of the Punjabi speakers. Perhaps, this is the reason why children do not pick-up /ɔ/ as a separate phoneme.

Chart for /ɔ/

Chart no. 13

SOUND /ɔ/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION		MEDIAL	IN ALL THREE POSITION		CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M		I	M		
1.	Below 2;0	NIL	NIL		100		NIL	/ɔrɜt/
2.	2;0 - 2;3	10	NIL		60		20	/bɔl/ or /tɔfɛ/
3.	2;3 - 2;6	15	NIL		50		20	
4.	2;6 - 2;9	5·5	5·5		44		22	
5.	2;9 - 3;0	12	NIL		30		30	
6.	3;0 - 3;3	10	NIL		53		20	
7.	3;3 - 3;6	13	NIL		54		26	
8.	3;6 - 3;9	10	NIL		40		30	
9.	3;9 - 4;0	18	2·5		29		22	
10.	Above 4;0	5·2	2·6		16		50	

The percentage of acquisition for the vowel /ɔ/ is very low in almost all the age-groups (correct response ranging between 20% to 30%), till group 9. In group 10 the acquisition for /ɔ/ is 50%. Incorrect responses are mostly in the initial position.

We see that even at the age of 4 years, the acquisition for /ɔ/ is rather low. The increases in percentage of correct response can be attributed to the school environment. This can only be ascertained by taking children of the older age groups, i.e. above 5 years.

Hindi and Punjabi are cognate languages. So, when a child substitutes a lexical item with the one to which he is exposed more often the substitution does not indicate whether the child has the sound or not, in his phonemic repertoire. By imitation method it was found that the child is able to imitate the sound very well but does not know as to where to use which lexical item. Words like /Idhɔ̃r/ and /Udhɔ̃r/ were substituted with corresponding Punjabi lexical items /Ithe/ and /uthe/. Similarly /dɔvai/ was substituted with /duvat/ by many subjects in the target groups. The vowel /ɔ/ was substituted with /u/ here. This again can be explained on the lexical level because the child acquires the lexical item /duvai/ and not /dɔvai/. Most of these words were not even our test words but during the investigation when such words appeared we started asking the subjects questions using these lexical terms. Similarly, /y/ was substituted by /j/ or by /E/ or /e/ for the word /ye/. /vo/ was substituted with /o/. This again can be explained at the level of lexical item and not at the level of phoneme.

TONAL PHONEMES

No separate test was conducted to test the tonal phonemes in Punjabi. After a preliminary study of the data, it was noticed that the responses for almost all voiced-aspirated test-words had some tonal feature. For detailed account of these voiced-aspirated sounds, please refer to the specific section in Chapter 2 (page 37) and specific sections on each one of these consonants in the following pages

CONSONANTS

Chart no. 14

SOUND /ɸ/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION			MEDIAL	IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F		I M F		
1.	Below 2;0	NIL	NIL	NIL		NIL	100	/pətəŋ/
2.	2;0 - 2;3	NIL	NIL	NIL		NIL	100	/ʈoɛ/
3.	2;3 - 2;6	NIL	NIL	NIL		NIL	100	/ɸɔɾ/
4.	2;6 - 2;9	NIL	NIL	NIL		NIL	100	
5.	2;9 - 3;0	NIL	NIL	NIL		NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL		NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL		NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL		NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL		NIL	100	
10.	Above 4;0	NIL	NIL	NIL		NIL	100	

Bilabial voiceless stop /p/ has 100%, acquisition in all the age-groups. None of the subjects have incorrect response for /p/ at the initial, medial or final position from the age below 2 years to above 4 years. This indicates that once /p/ is acquired, it remains constant in a child's speech and is not substituted with any other sound in any case. It also indicates that the acquisition of /p/ takes place very early in child's speech.

In order to see the development of /p/ as a phoneme in a child's speech one would require data from children less than even one year and nine months, i.e., the youngest in our target group.

Chart no. 15

SOUND /b/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	5·6	NIL	NIL	NIL	83	/bas/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	/sabun/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/seb/
4.	2;6 - 2;9	NIL	NIL	NIL	NIL	100	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

Bilabial voiced stop /b/ is acquired 100% in all positions (initial, medial, final) by all the children except for the children below 2 years (group 1). The percentage of acquisition is 83% in this group. For /b/ as, only two children (age:) out of 120 of the target group have incorrect response in group 1, this may be taken as an exception. /b/ is acquired very early by the target group. The incorrect response for all the 3 positions in the group 1 is nil, indicating that the children have incorrect response only in the initial, medial or final positions. The chart shows that the incorrect response is only in initial position (5.5%).

/b/ is therefore, acquired very early by the subjects. It also indicates that once /b/ is acquired, it remains constant in a child's speech.

/b/ is substituted with /d/, only in initial position only by two children. In order to see the development of /b/ as phoneme in a child's speech one would require data from children less than even 1 year 9 months that is the youngest in our target group.

Chart no. /6

SOUND /t/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	NIL	100	/tala/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	/ktob/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/dät/
4.	2;6 - 2;9	NIL	NIL	NIL	NIL	100	
5.	2;9 - 3;0	NIL	NIL	NIL	7	93	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

Dental voiceless stop /t/ is acquired 100% in all positions by all the subjects except for the children in the group 5 (i.e. 2;9 - 3;0). Correct response is 93% in this group, where 5% of the subjects gave incorrect response in all the three positions. In group 5, only one subject (age: 2;10) out of 13 children in this amounts to 7.7% incorrect responses in this group. Since this is the only child out of all the 120 children we may take it as an exception and say that /t/ is acquired very early by the target group. Once /t/ is acquired it remains constant in a child's speech.

Many subjects responded /dɔ̃nd/ for the lexical item /dɑ̃t/, chosen for /t/ in final position. Hindi and Punjabi are cognate languages, so this aspect can be explained at the lexical level and not at the phonemic level. In this case, subjects substitute one lexical item for another, the one which they hear more often. This substitution however, does not indicate that the child has not acquired the sound /t/ in the final position. When they were asked other words like /rat/ and /sat/, their response for /t/ final position was correct.

In order to see the development of /t/ as a phoneme in a child's speech are would require data from children less than even one year and nine months, i.e. the youngest in our target groups.

Chart no. 17

SOUND /d/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	5·6	NIL	2·8	NIL	83	/dəvai/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	/badam/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/cãnd/
4.	2;6 - 2;9	NIL	NIL	NIL	NIL	100	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

Dental voiced stop /d/ is acquired 100% in all positions by all the subjects except for the children in group 1. Correct response is 83% in this group where the incorrect response for all the 3 positions is nil. Incorrect acquisition is 5.6% in initial position and is 2.8% in final position. 2 children out of 12 in this group had incorrect response; i.e. 1 child had incorrect response in initial position and 1 in the final position.

/d/ is, therefore, acquired very early by the subjects. It also indicates that once /d/ is acquired, it remains constant in a child's speech.

/d/ is substituted with voiceless /t/ in the initial position and is deleted in the final position. Many subjects had the response for /cɔnd/ as /cɔnna - mama/ or /cɔnn/.

Many subjects had lexical items /dɔvai/ substituted with /duvai/, and /badam/ substituted with /vɔdam/. Though these two substitutions show that subject have the acquisition for /d/ in the initial and medial positions, the substitution /ɔ/ → /ʊ/ or /ba/ → /vɔ/ can only be explained at the lexical level and not at the level of phoneme. The child substitutes the lexical items with the one he has acquired earlier or with the one he hears more often.

In order to see the development of /d/ as a phoneme in a child's speech one would require data from children less than even one year and nine months, i.e. the youngest in our target group.

Chart no. 18

SOUND /ṭ/

INCORRECT RESPONSES (IN %)

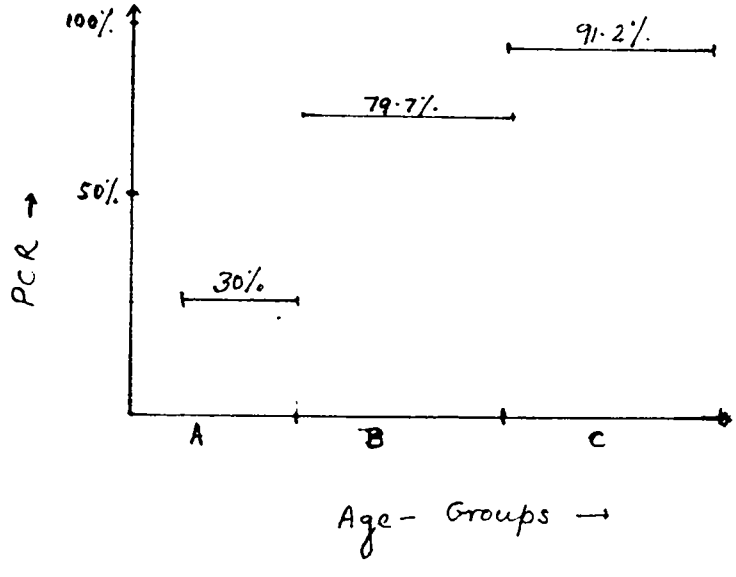
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION			MEDIAL	IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F		I	M	F		
1.	Below 2;0	14	NIL	NIL		58			NIL	/ṭəmaṭər/
2.	2;0 - 2;3	6·6	3·3	3·3		20			60	/moṭa/
3.	2;3 - 2;6	NIL	NIL	NIL		10			90	
4.	2;6 - 2;9	3·7	NIL	NIL		22			66	/koṭ/
5.	2;9 - 3;0	NIL	NIL	NIL		15·4			84	
6.	3;0 - 3;3	NIL	NIL	2·3		14			79	
7.	3;3 - 3;6	NIL	2·3	2·3		7			85	
8.	3;6 - 3;9	NIL	NIL	3·3		10			80	
9.	3;9 - 4;0	NIL	NIL	NIL		NIL			100	
10.	Above 4;0	NIL	NIL	NIL		NIL			100	

The acquisition of the retroflex /ṭ/ is high in all the age-groups except for the group 1 where all the children gave 58% incorrect response in all the 3 positions and 14% in the initial position, indicating some correct respones in the medial and the final positions.

The chart indicates a fall in the percentage of correct response in group 4, but it again increases in the later groups. In groups 9 and 10, all the subjects had acquired /ṭ/ in all the positions.

It also indicates that most of the children have incorrect response in all the three positions together as compared to the initial, medial and final position separately. The acquisition pattern for /ṭ/ indicates that children from the age of 2;3 to 3;3 (i.e. one year) have around 79% correct response. This percentage increases in their next year i.e. between 3;3 to 4;3 to 91%. This shows that /ṭ/ is acquired by most of the children by the age of 2;3 and by all children by the age of 4 years.

The acquisition pattern for /ṭ/ is shown in the following graph:



From this we may conclude that excpet a few children substituting /ṭ/ by /t/, /ṭ/ is acquired family early by most children, i.e. by 2 years and 3 months to 2 years and 6 months of age.

Chart no. 19

SOUND /ḍ/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	5·6	NIL	2·8			50	25	/ḍəmru/
2.	2;0 - 2;3	6·6	NIL	3·3			20	60	/jhənḍa/
3.	2;3 - 2;6	3·3	NIL	6·6			40	40	
4.	2;6 - 2;9	11	NIL	NIL			33	44	/sūḍ/
5.	2;9 - 3;0	5·2	NIL	5·2			8	69	
6.	3;0 - 3;3	2·3	NIL	4·6			28	56	
7.	3;3 - 3;6	4·6	NIL	4·6			14	56	
8.	3;6 - 3;9	NIL	NIL	NIL			40	60	
9.	3;9 - 4;0	NIL	NIL	NIL			42	56	
10.	Above 4;0	5·4	NIL	NIL			8	75	

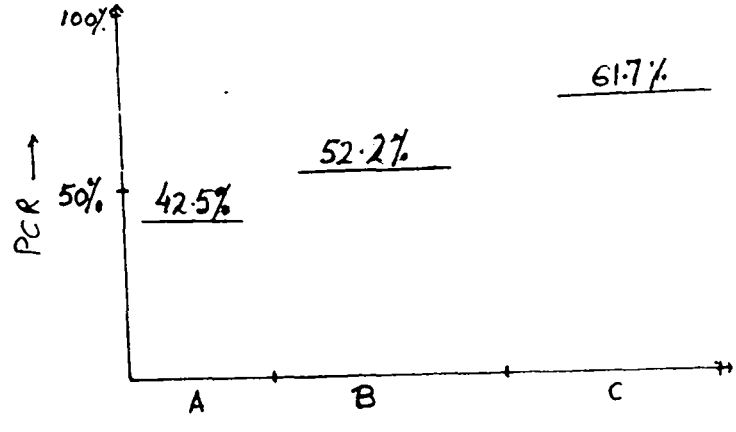
The correct response for retroflex /ḍ/ is 25% in group 1. This group has 50% incorrect response in all three positions. The incrorrect response only at initial position and only at final position is 5.6% and 2.8%. It indicates that while 50% subjects have acquired /ḍ/ in all positions, 25% of them have partially incorrect acquisition in either initial or final position. After group 1 we find a gradual increase in the percentage of correct responses.

A fall is seen in the percentage of incorrect response at IMF from group 2 to group 10. More subjects have incorrect response only in the initial or only in the final position. No incorrect response is present in the medial position.

The chart indicates that the subjects gradually acquire the retroflex /ḍ/ from group 2 onwards (i.e. above 2 years of age). Incorrect response is mostly either in the initial position only or in the final position only.

/ḍ/ is substituted with dental /d/ in the three positions; initial, medial and final. It is substituted with /ṛ/ and /ṛh/ in the final position. This may be since the test word, /sũḍ/ shows variations in adult speech as well and the prevalent forms are /sũḍh/, /sũṛh/, /sũnḍ/ etc.

The acquisition pattern shows the gradual acquisition of /ḍ/, as follows: (The graph shows the acquisition pattern for /ḍ/ at one year interval - A. below 2 years - 2;3, B. 2;3 - 3;3 and C. 3;3 - 4;4).



The percentage of correct response does not reach 100% even in group 10 which indicates that the children are still in the process of acquiring /d/.

SOUND: /ph/

The voiceless aspirated bilabial stop /ph/ was tested mainly at two positions, initial and medial. For the final position, lexical item chosen was /gilaf/.

We are aware of the fact that even in the adult speech in Delhi Hindi and Punjabi, /ph/ is mostly substituted by /f/. We decided to delete the word /gilaf/ as the lexical item which is there in the standard articulation charts used in AIIMS, etc.

The chart indictes that the acquisition of /ph/ is very low in all age groups.

Chart no. 20

SOUND /ph/

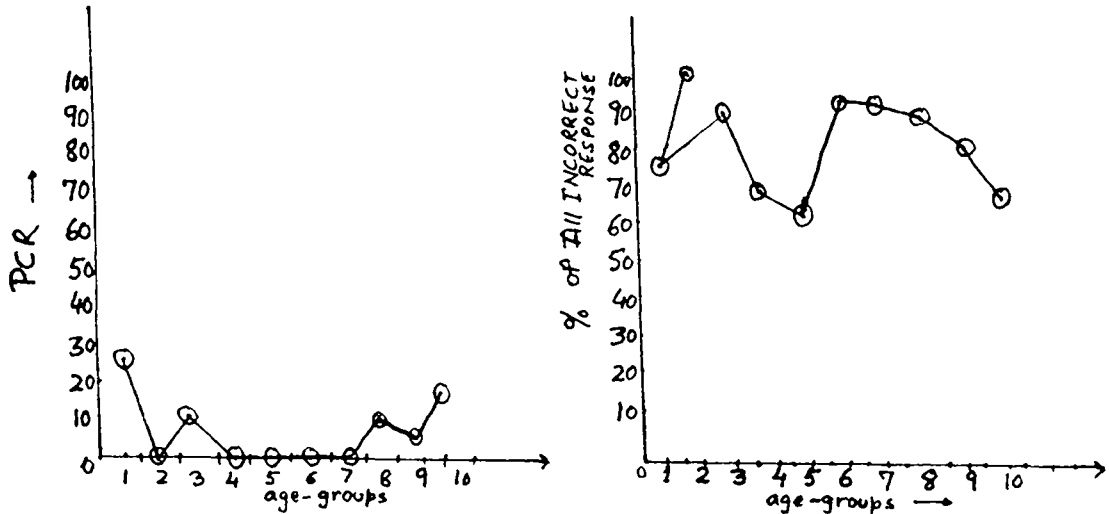
INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION		IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	I M		
1.	Below 2;0	NIL	NIL	75	25	/phol/
2.	2;0 - 2;3	NIL	NIL	100	NIL	/mũŋphali/
3.	2;3 - 2;6	NIL	NIL	90	10	
4.	2;6 - 2;9	NIL	16·5	66	NIL	
5.	2;9 - 3;0	NIL	23	62	NIL	
6.	3;0 - 3;3	2·3	NIL	91	NIL	
7.	3;3 - 3;6	2·3	NIL	91	NIL	
8.	3;6 - 3;9	NIL	NIL	90	10	
9.	3;9 - 4;0	3·5	NIL	84	7	
10.	Above 4;0	NIL	5·6	64	17	

Going through the percentage of total correct responses, a definite correlation between the acquisition of the phoneme /ph/ and age as an important variable is noticed. The percentage of incorrect responses in the two positions (initial and medial) is taken into account together and separately. The chart indicates 25% of the subjects have correct response for /ph/ in group 1, 75% of the children have incorrect response of /ph/ in both the position. In group 2, all children have /ph/ incorrect in both initial and medial positions, thus acquisition is nil. In group 3, correct response is 10% while incorrect response

is 90% in both positions. In group 4, the acquisitions is nil. 66% of the subjects have incorrect response in all the two positions while 16.5% have incorrect response only in medial position. In group 5 the correct response is nil. 62% of the subjects have incorrect response in the two position while 23% have incorrect response in only medial position. In group 6 the acquisition is nil, with 91% subjects giving incorrect response in both positions. 2.3% of the subjects have incorrect response only in the initial position or only in the medial position. In group 7, acquisition is nil and incorrect response for both position is 91%. Incorrect response, by the subjects is only in the initial position is 2.3%. In group 8 percentage of correct response slightly rises to 10% with 90% incorrect response in both positions. For group 9 the correct response is 7%. In only initial position the incorrect response is 84% for both the position and 3.5% incorrect response is in only initial position. In group 10, the acquisition is 17% with 64% subjects showing incorrect response in both medial and initial positions. 5.6% have incorrect response in only medial position. This indicates that children have more incorrect responses in the medial position for /ph/ in comparison with the initial position. This may be attributed to the fact that in Delhi Hindi, evenin adult speech it is more common to hear /mũŋphəli/ pronounced as /mũ (ŋ)fəli /. Perhaps the child is never

exposed to the correct pronunciation for the medial position especially in this word /munphalɛ /. Most of the cases which had correct responses were elicitation by imitation method. Children were good at imitation but otherwise they varied between /ph/ and /f/. The preference was for /f/. Acquisition pattern for /ph/ can be seen in the following graphs:



The correct response is 25% in the lowest group, this can be attributed to the imitation method of elicitation. The all correct responses graph shows a definite correlation between the acquisition of /ph/ and age as the most important variable. The correct response is nil in groups 2,4,5,6 and 7. It rises slightly to 10% in group 8. This itself indicates that /ph/ is one of the those sounds which are acquired fairly late, at least not until the age of 3 years and 6 months age, when schooling begins. More data is required from children above 4 years to see the stages of acquisition of /ph/, data would also be required from the adult speech that the child exposed to, in case of /ph~f/ variation.

Chart no. 21

SOUND /bh/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	NIL	NIL	NIL			83	17	/bhalu/
2.	2;0 - 2;3	NIL	NIL	NIL			100	NIL	/gobhi/
3.	2;3 - 2;6	16.5	3.3	6.6			50	NIL	/jubh/
4.	2;6 - 2;9	11	3.7	NIL			55	NIL	
5.	2;9 - 3;0	7.8	2.6	2.6			77	NIL	
6.	3;0 - 3;3	NIL	NIL	NIL			91	7	/bhai/
7.	3;3 - 3;6	NIL	NIL	4.6			84	NIL	
8.	3;6 - 3;9	NIL	NIL	NIL			90	10	
9.	3;9 - 4;0	9.2	NIL	2.3			63	7	
10.	Above 4;0	10.8	5.4	NIL			48	17	

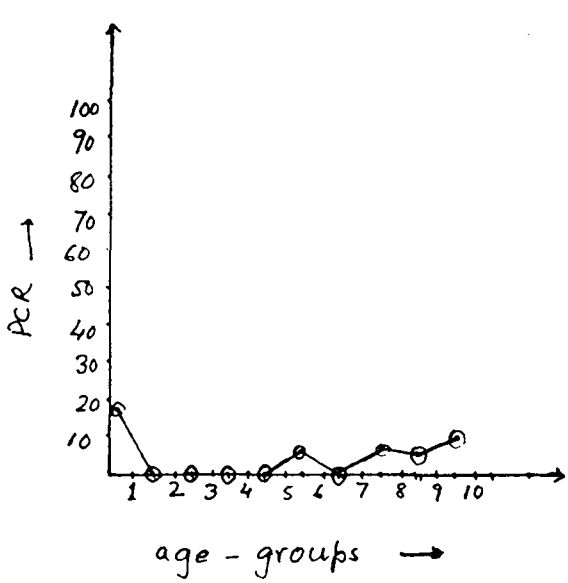
The acquisition of voiced aspirated stop /bh/ is very low in all age-groups. Going through the percentageof total correct response we find a definite correlation between the acquisition of /bh/ and age as the most important variable. The percentages of incorrect responses in initial, medial and final positions are also taken into account togather and separately. The chart indicates 17% of the subjects have acquired /bh/ in group 1. 83% of the subjects have incorrect response in all three positions. This 17% can be attributed to the imitation method of elicitation. In group 2, the correct response is nil and all the subjects have incorrect

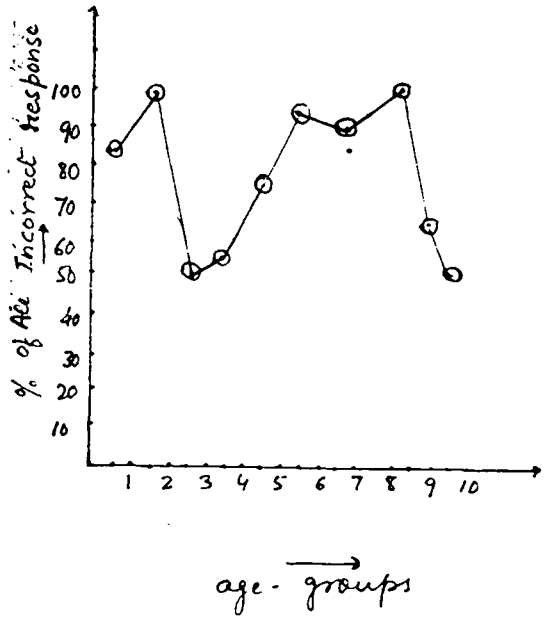
response in all three positions. The correct response is nil in groups 3,4,5 and in 7, while in group 6 it is negligible 7%. The response pattern /bh/ is of one of those sounds which are acquired fairly late, at least not until the age of 3 years to 3 years and 6 months of age, when schooling begings.

In group 8, the acquisition is very low, that is 10%. 90% children have incorrect response in all the three positions. In group 9, 7% is correct response. Incorrect response is 63% in all the three position, 9.7 in only initial position and 2.3% in only final position. In group 10, 17% is the correct response. 48% of the subjects have incorrect response in all three positions while 10.8% have only in initial position and 5.4% have only in medial position.

/bh/ is substituted with /b/ in initial, medial and final positions. 35% of the subjects substitute /bh/ with /b/ or /p/ in initial position followed by a vowel with some tonal feature.

The acquisition pattern for /bh/ is still in the process of emerging. This is shown with the help of these graphs.





All correct response graph shows a definite correlation between the acquisition of /bh/ and age as the most important variable. It shows that only after the age of 3 years some children show the correct acquisition of /bh/ as a phoneme, even if it is as low as 7% or 17%. More data is required from children of 4 years and above so as to show different stages of acquisition of this phoneme.

Since all incorrect response is not 100% in any group and there are some subjects giving correct response only in the initial, medial or only in the final position, we may conclude that the process of acquisition has started already (by group 3 i.e. 2 years and 3 months to 2 years and 6 months) but not completed even by the age of 4 years and 4 months.

Chart no. 22

SOUND /th/

INCORRECT RESPONSE (IN %)

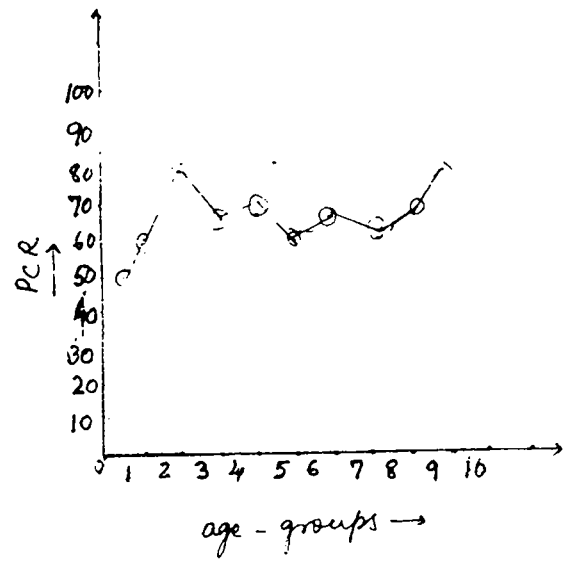
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	2·8	2·8	2·8	33	50	/thali/
2.	2;0 - 2;3	NIL	3·3	6·6	20	60	/hathi/
3.	2;3 - 2;6	NIL	NIL	NIL	20	80	/hath/
4.	2;6 - 2;9	3·7	NIL	3·7	11	66	
5.	2;9 - 3;0	5·2	2·6	4·6	7·7	69	
6.	3;0 - 3;3	NIL	NIL	4·6	28	57	
7.	3;3 - 3;6	NIL	NIL	9·3	7	64	
8.	3;6 - 3;9	3·3	NIL	NIL	30	60	
9.	3;9 - 4;0	6·9	NIL	NIL	14	63	
10.	Above 4;0	2·7	NIL	5·5	8	75	

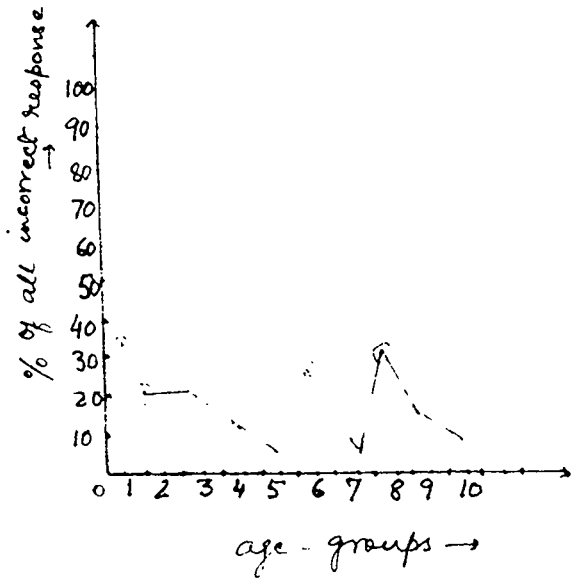
The percentage of correct response for the voiceless aspirated /th/ indicates an increase from 50% (in the lowest age-group) to 75% (in the oldest age-group). In group 2 the correct response is 60%. Incorrect response is 20% in the three positions, 3.3% in only medial position and 6.6% in only final position. In group 3, the correct response is 80% while the incorrect response response is 20% at IMF positions. In group 4, the correct response is 66% with 11% incorrect at IMF, 3.7% at only initial and 3.7 at only final position. The correct response in group 5 is 69%. Incorrect response is 8% (7.7%) at IMF, 5.2% in only initial, 2.6% in only medial and 4.6% in only final positions. From group 6 to group 9 (i.e., in group 6,7,8 and 9) the percentage for correct response varies between 57% to 63%. The correct

response at the age of above 4 years is 75%, i.e. in group 10.

The chart indicates a slow increase in the percentage of correct response. It also shows most of the children from the target group have /th/ in their speech after the age of 2 years and 3 months. The substitutions for /th/ in either initial or medial or final position or in all the three positions, increase after the age of 3 years, when the schooling begins. This indicates that some children tend to be substituting /th/ either in initial or medial or final position. As the percentage of correct response does not reach 100%, /th/ as a phoneme is still in the process of estabilishing itself in the child's speech.

The graphs given below show the acquisition pattern for /th/:





The graph showing incorrect responses in IMF indicates that after the age of 3 years (group 5), children have more substitutions for /th/ by /t/ but the fall in percentage from 30% to 14% and 8% in groups 8, 9 and 10 again indicates the process of acquisition for /th/. The all correct responses also indicate an upward graph from 3rd group onwards. This indicates that /th/ is acquired generally after the age of 2 years and 3 months but not 100% until the age of 4 years and 4 months. More data is required from chidlren of 4 years and above to see the later stages of acquisition of /th/.

Chart no. 23

SOUND /dh/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	100	NIL	/dhanuš/
2.	2;0 - 2;3	13	NIL	3·3	60	NIL	/gadha/
3.	2;3 - 2;6	6·6	NIL	NIL	50	30	/dudh/
4.	2;6 - 2;9	11	NIL	7·4	33	11	
5.	2;9 - 3;0	5·2	NIL	5·2	69	15	
6.	3;0 - 3;3	4·6	NIL	4·6	56	14	
7.	3;3 - 3;6	13·8	NIL	6·9	28	14	
8.	3;6 - 3;9	6·6	NIL	NIL	50	30	
9.	3;9 - 4;0	4·6	NIL	2·3	56	21	
10.	Above 4;0	13·8	NIL	NIL	24	32	

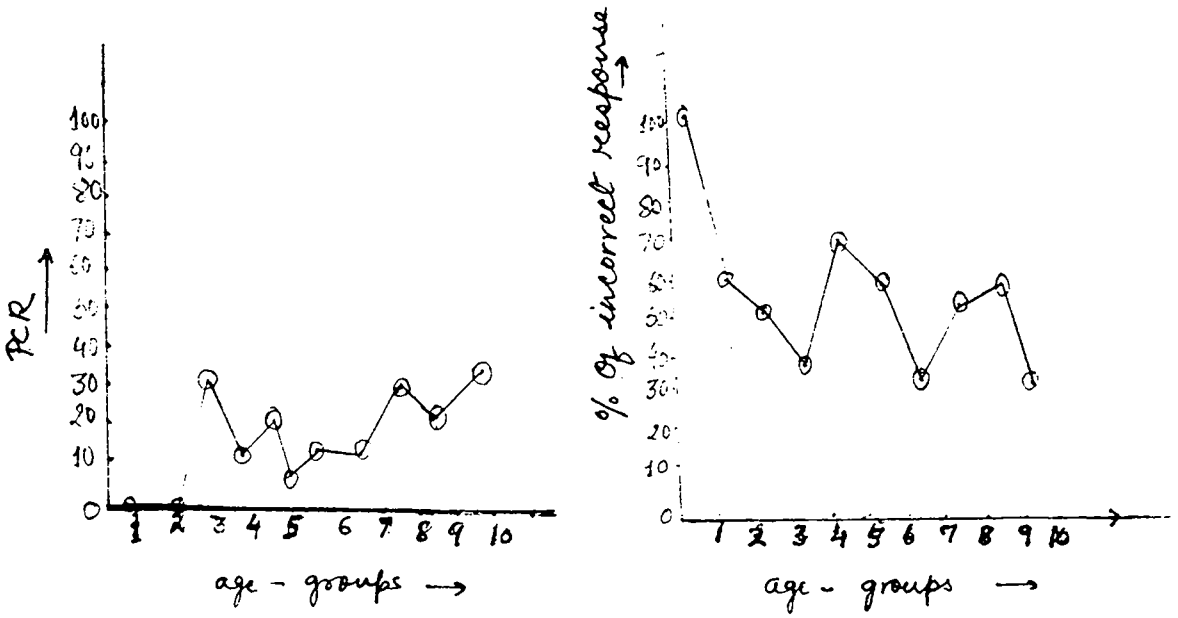
The correct response for the voiced aspirate dental stop /dh/ is nil for the group 1 and group 2. In group 1 children gave incorrect response responses in all the three position (IMF). In group 2, the incorrect response is 60% by the subjects in all the three position (IMP) and 13% in only initial position, 3.3% in only final position. The total correct response varies between 32% and 11% in the later groups. To find any definite pattern for the acquisition of /dh/, the percentage of incorrect response response in the three positions is taken into account.

All correct response percentage drops in the groups 4, 5, 6 and 7 as the subjects have more incorrect response in the initial or final position.

In the groups 8,9 and 10, the response remains very low (30%, 21% and 32% respectively). By looking into the incorrect responses in the three positions, we find that /dh/ is mostly incorrect in the initial position.

/dh/ is substituted with /d/ in initial, medial, final position, 12% of the subjects substituted /dh/ with /d/ in initial position followed by a vowel with some tonal variations. Only 5 subjects out of 120 substituted /dh/ with /t/ in only initial position with some tonal variations.

The correct response pattern for /dh/ can be seen as given below:



All correct response gaph shows a definite correlation between the acquisition of /dh/ and age, as important vriable. It shows an upward graph from nil to 32% and it indicates that /dh/ is acquired generally after 4 years and 4 months. The graph showing the incorrect response shows a fall from 100% to 24% though there is no pattern in between, there is a definite indication of the process of acquisition. Which is beter indicated by the following graphs with three age groups only. For the average of correct response at one year intervals (i.e., A. below 2 years - 2;3, B. 2;3 - 3;3 and C. 3;3 - 4;4).

Chart no. 24

SOUND /ṭh/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	NIL	NIL	NIL		100		NIL	/ṭhela/
2.	2;0 - 2;3	NIL	3·3	NIL		30		60	/laṭhi/
3.	2;3 - 2;6	3·3	NIL	NIL		30		60	/aṭh/
4.	2;6 - 2;9	3·7	7·4	NIL		33		33	
5.	2;9 - 3;0	NIL	NIL	NIL		33		67	
6.	3;0 - 3;3	4·6	2·3	NIL		21		56	
7.	3;3 - 3;6	6·9	NIL	NIL		14		64	
8.	3;6 - 3;9	3·3	NIL	NIL		20		70	
9.	3;9 - 4;0	2·3	2·3	NIL		14		70	
10.	Above 4;0	2·9	NIL	NIL		24		67	

The correct response for the voiceless aspirated /ṭh/ is nil in group 1. The incorrect response is only in the initial and medial positions. This is perhaps due to the choice of test words /ṭhela/ and /laṭhi/. These test-words were substituted with the other lexical items such as, /reṛi/ and /ḍɔ nḍa/. This substitution of lexical items continues in the later age-groups also but children begin to show the partial acquisition of /ṭh/ from group 2 onwards.

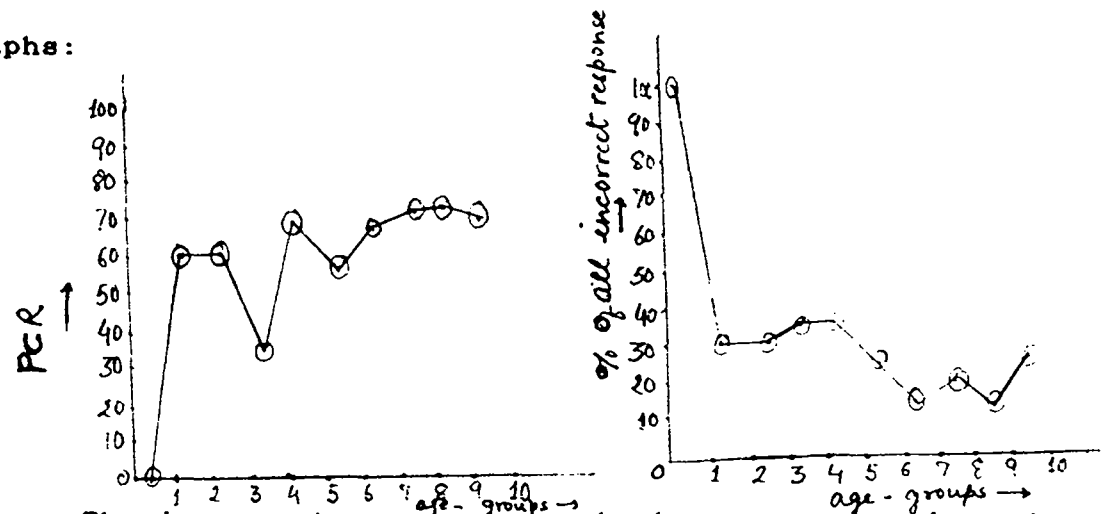
The percentage of correct response from group 2 to group 10 varies between 60% to 70% except in group 4. The correct response in group 4 is 33% where 3 children out of 9 subjects in this group had incorrect responses in IMF

position. These three children have overall poor response, therefore, this percentage can be taken as an exception.

The overall response from group 2 to group 10 indicates that since the percentage of correct response varies between 60% to 70% and has not yet reached 100% some children continue to substitute /ṯh/ by /th/ in the three positions, and some children substitute /ṯh/ in the medial position with /ṯ/.

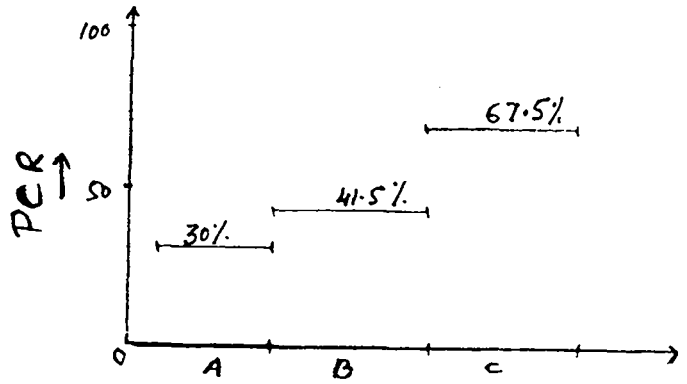
By looking at the chart, it can be concluded that /ṯh/ is acquired fairly early by the children i.e., by the age of 2 years to 2 years and 3 months.

The response pattern for /ṯh/ can be seen in these graphs:



The incorrect response graph shows errors going down after the age of 2 years to 2 years and 3 months i.e., group 2, indicating that the acquisition for /ṯh/ begins by this age. The groups given below shows the acquisition pattern

for /ṭh/ at one year interval - A. below 2 years, B. 2;3 - 3;3 and C. 3;3 - 4;4.



/ṭh/ is acquired fairly early, by the age of 2 years to 2 years and 3 months. As the percentage of correct response does not reach 100% it shows that, some children continue to substitue /ṭh/ in all the age-groups while it is acquired by a fairly large number of a children from age-group 2 years to 2 years and 3 months, onwards. In seven groups out of ten we find incorrect responses in the initial position only, and that was not always substitution by /ṭ/ or /th/ as we would normally expect. Instead, a no. of children opted for a different lexical item /ṛeri - reṛi -rehṛi/ which was more frequently used than /ṭhela/ in Punjabi homes. This could be one of the reasons why percentage of correct response does not reach 100% even in the oldest age group inspite of 60% percentage of correct response in children as young as two years.

Chart no. 25

SOUND /ḍh/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION		MEDIAL	IN ALL THREE POSITION		CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M		I	M		
1.	Below 2;0	NIL	NIL		80		20	/ḍholək/
2.	2;0 - 2;3	NIL	NIL		60		40	
3.	2;3 - 2;6	6.6	NIL		30		50	/mĕdhək/
4.	2;6 - 2;9	11	5.5		22		44	
5.	2;9 - 3;0	7	NIL		15.4		69	
6.	3;0 - 3;3	4.6	NIL		35		50	
7.	3;3 - 3;6	9.2	NIL		7		64	
8.	3;6 - 3;9	6.6	NIL		20		60	
9.	3;9 - 4;0	6.9	NIL		NIL		77	
10.	Above 4;0	2.7	NIL		NIL		91	

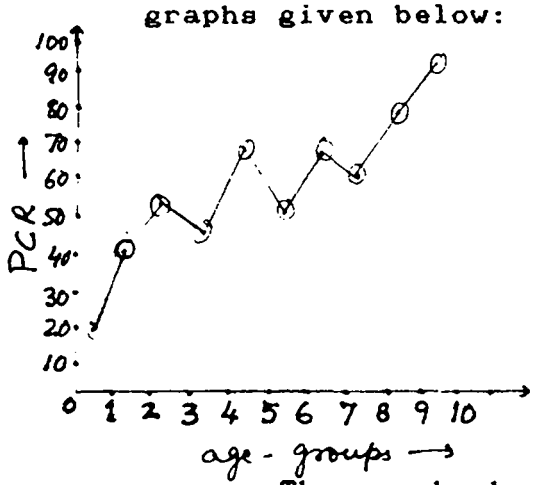
To test the retroflex voiced aspirated /ḍh/ in the final position, no common word was found. So, /ḍh/ was tested at initial and medial positions only.'

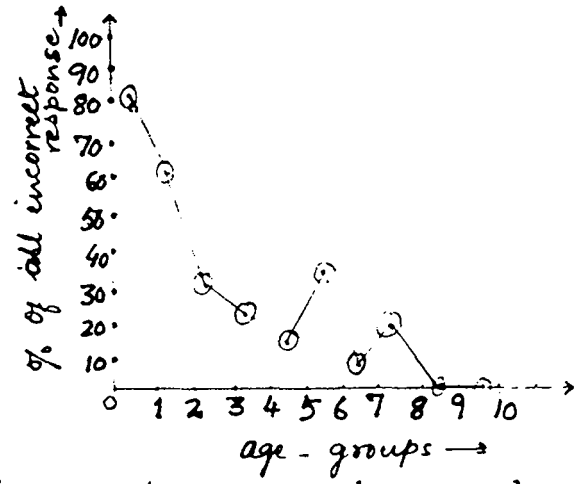
The percentage of correct response indicates 20% response in group 1. This 20% correct response is perhaps due to the reason that children in this group were very small and needed prompting. In doing so, 2 children out of 12 in this group had the correct sound after imitation.

From group 2 to group 10, the percentage of correct response shows an increase from 40% to 91%. The incorrect

response at IM position falls from 60% (in group 2) to 20% in group 8. The incorrect response at IM position is nil in group 9 and group 10, which indicates that /ḍh/ is acquired by the children by the age of 3 years and 9 months, with a exception of children giving incorrect response at the initial position.

The acquisition pattern for /ḍh/ can be seen in the graphs given below:





The graph showing the incorrect response has a clear indication of acquisition of /ḍh/ by the age of 3 years and 9 month and above. It indicates a fall from 80% to 20% (nil) from group 1 to group 8 and then in group 9 and 10 where it is nil.

The all correct response graph also indicates an increase in the percentage. It does not reach 100% in the oldest age group of the target group, which indicates that some children tend to substitute the sound /ḍh/ either in the initial position or the medial position. Therefore, it

is 91% in the oldest age group. More data is required from children above 4 years so as to show the acquisition of /ḍh/ is substituted with /ḍ/ or /ṭ/ or with aspirated dental /dh/. 16% of the children substituted /ḍh/ with unaspireted retroflex /ḍ/ in the initial position followed by a vowel with some tonal variations. 14% of the children substituted /ḍh/ with retroflex /ṭ/ in the initial position with some tonal variations.

Many children substitued /mẽḍhɔk/ with /mẽḍɔk/. This can be attributed to the fact that even in adult speech, it is common to hear /mẽḍɔk/ instead of /mẽḍhɔk/.

The pattern of acquisition for /ḍh/ (at one year interval) can be seen below:

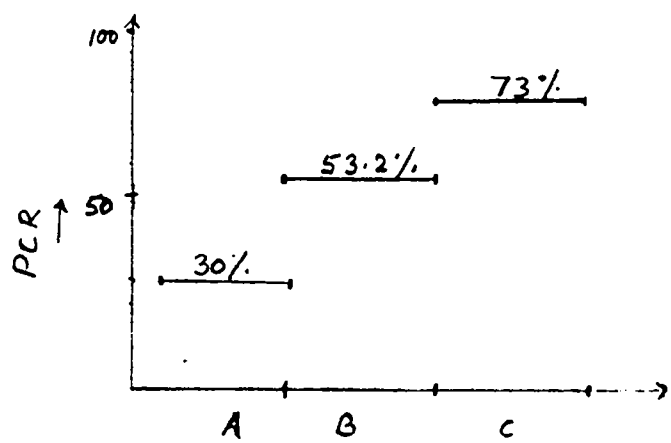


Chart no. 26

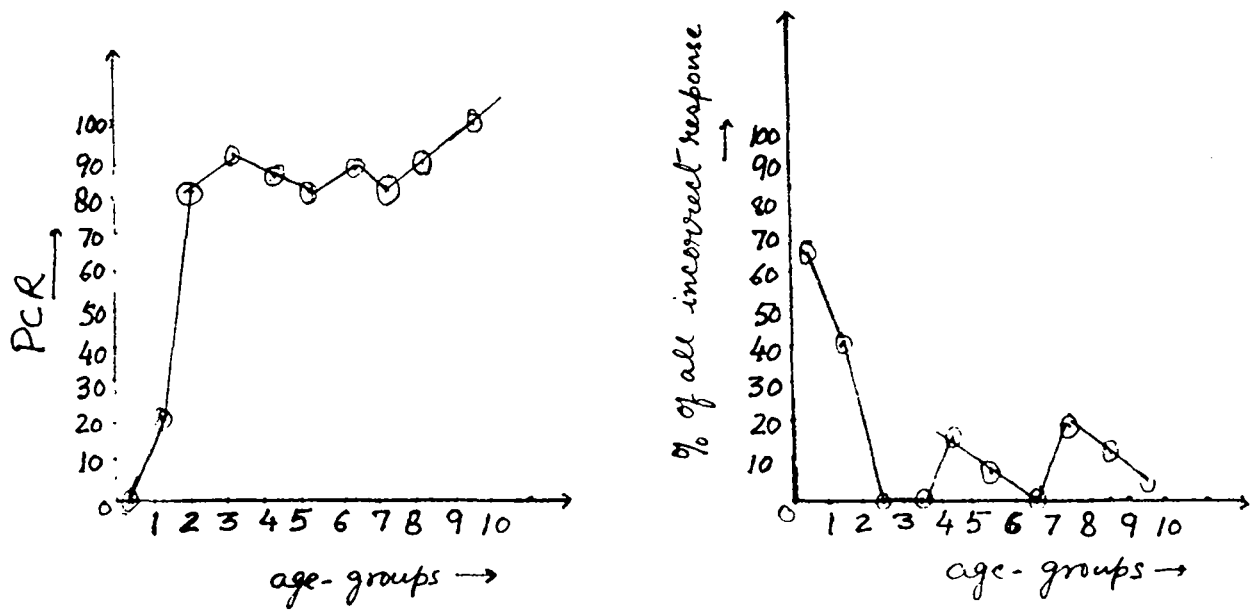
SOUND /k/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	8·4	5·6	2·8	66	NIL	/kela/
2.	2;0 - 2;3	13·2	10	NIL	40	20	/caku/
3.	2;3 - 2;6	6·6	3·3	NIL	NIL	80	/nak/
4.	2;6 - 2;9	3·7	NIL	NIL	NIL	88	
5.	2;9 - 3;0	NIL	NIL	NIL	15	85	
6.	3;0 - 3;3	4·6	NIL	NIL	7	80	
7.	3;3 - 3;6	2·3	2·3	NIL	NIL	85	
8.	3;6 - 3;9	NIL	NIL	NIL	20	80	
9.	3;9 - 4;0	NIL	NIL	NIL	14	86	
10.	Above 4;0	NIL	NIL	NIL	8	91	

The percentage of correct response for the voiceless velar stop /k/ is nil in the group 1 while incorrect response in IMF is only 66%. This indicates a partial acquisition of /k/ in this group, some children mispronouncing it early in the initial position some in the medial and some in the final position. So the process of acquisition of /k/ has definitely begun by the age of 2 years. By looking into the percentage of total correct response in all age-groups, we find a gradual increase in the percentage. From group 1 to group 2 the percentage of correct response is very low, but there is a sudden increase

and it reaches 80% in groups. It remains more or less the same in the later group till group 10. Incorrect responses in all the three positions indicate that their percentage decreases as the age increases and more incorrect responses are found either only in the initial or medial position. The acquisition pattern for /k/ can be seen as:



The incorrect response remains low for /k/ after the age of 2 years and 6 months. The graph showing all correct response indicates that /k/ is not acquired by the age of 2 years. Although the acquisition process starts before the age of 2 years and the children acquire /k/ by the age of 2 years and 6 months. After this group there are substitutions of /k/ by /t/ only by some children in some positions.

Chart no. 26

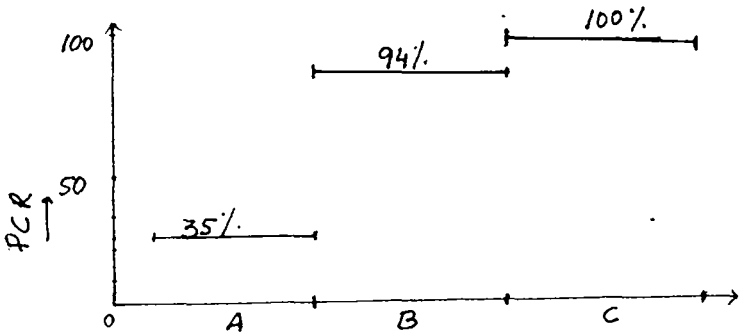
SOUND /g/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	2·8	2·8	NIL	83	NIL	/gamla/
2.	2;0 - 2;3	NIL	NIL	NIL	30	70	
3.	2;3 - 2;6	NIL	NIL	NIL	10	90	/began/
4.	2;6 - 2;9	NIL	NIL	NIL	11	89	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	/ag/
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

Percentage of correct response of the Velar stop /g/ is nil in group 1. Incorrect response for the three positions is 83% and 2.8 in only initial position, 2.8% in only medial position. /g/ is substituted with /d/ in this group. In group 2, correct response is 70% and 30% subjects show incorrect response at IMF positions. In group 3, correct response is 90% while 1 child shows incorrect response in the IMF positions. In group 4, correct response 89% while 1 subject incorrect response in all three positions. Since, there is only single child in group 3 and 4, we may takes them as exceptions. correct response reaches 100% in group 5 and remains so till group ten.

The pattern of acquisitionn that emerges for /g/ is as shown below:



The chart indicates that though there is only partial acquisition of /g/ in group 1, children acquire the velar unaspirated stop /g/ very early by the age of 2 years and 3 months. Once /g/ is acquired it remains in a child's speech.

Chart no. 27

SOUND /kl/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	5·6	2·8	NIL	75	NIL	/khɔrgoš/
2.	2;0 - 2;3	6·6	3·3	3·3	30	30	/pɔŋkha/
3.	2;3 - 2;6	9·9	6·6	3·3	20	50	/ākl/
4.	2;6 - 2;9	7·4	NIL	3·7	22	54	
5.	2;9 - 3;0	NIL	NIL	NIL	23	77	
6.	3;0 - 3;3	NIL	2·3	2·3	28	57	
7.	3;3 - 3;6	4·6	4·6	NIL	7	79	
8.	3;6 - 3;9	3·3	NIL	NIL	20	70	
9.	3;9 - 4;0	2·3	NIL	NIL	21	70	
10.	Above 4;0	5·5	NIL	2·7	8	67	

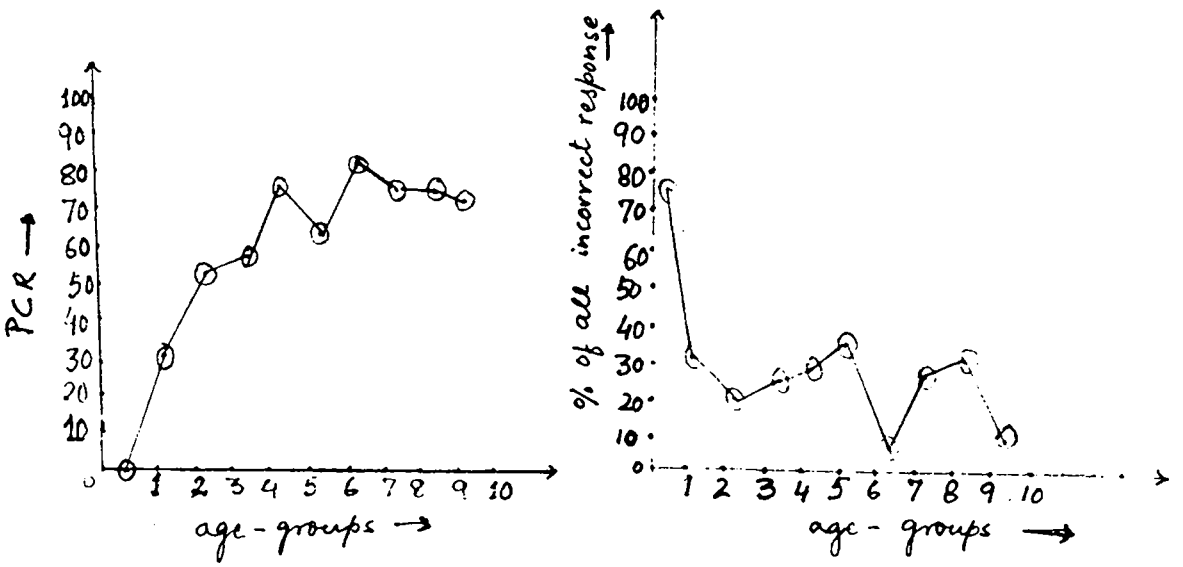
The percentage of correct response is nil in group 1. Incorrect response is 75% in IMF positions, 5.6% in initial and 2.8% in the medial position. In group 2, the correct response is 30% and incorrect response is 30% in IMF positions, 6.6% in initial, 6.6% in medial and 3.3% in the final position. From group 3 to group 10 the percentage of correct response indicates a process of acquisition, although there is no definite pattern as such in between these groups. The percentage of correct response is 50% in group 3 and 67% in group 10.

From group 3 to group 10 the percentage of incorrect response in IMF positions is low, as it becomes 20% to 8%. The incorrect response at the three positions i.e., either initial or medial or final position indicates that children had more substitutions in either of the three positions.

By looking at the percentage of correct response, as well as the incorrect IMF response , we find that /kh/ is acquired as a phoneme by a number of children by the age of 3 years and 3 months to 3 years and 6 months. Since the percentage of correct response does not reach 100% even in group 10, it shows that the process of acquisition of /kh/ continues even after the age of 4 years and 4 months.

/kh/ is substituted by velar /k/ by around 19% subjects, mostly in group 3 and above. /kh/ is substituted with /th/ in 18% rsponses in the lowest group and group 2.

The acquisition pattern for /kh/ can be seen in the following graphs.



These graphs indicte that the percentage for incorrect response shows a downward trend, indicating the acquisition of /kh/ as a phoneme begins by the third age group i.e. 2 years and 6 months onwards and picksup after the age of 3 years and 3 months when the schooling begins. The graph for all correct responss also indicates the same and that the process of acquisition for /kh/ is still continuing. More . data is needed as to show the different stages of acquisition of /kh/ after the age of 4 years and 4 months.

/kh/ :

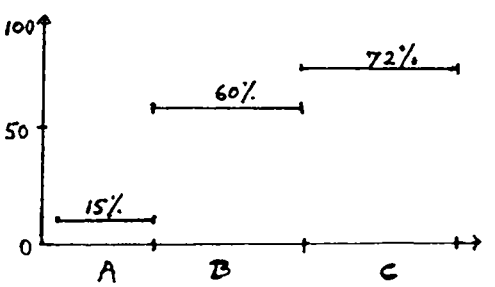


Chart no. 28

SOUND /gh/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	100	NIL	/ghɔri/
2.	2;0 - 2;3	16.5	NIL	6.6	50	NIL	/kangha/
3.	2;3 - 2;6	13.2	NIL	6.6	30	30	/bagh/
4.	2;6 - 2;9	3.7	NIL	7.4	55	22	
5.	2;9 - 3;0	7.8	NIL	5.2	23	54	
6.	3;0 - 3;3	12	NIL	4.6	28	36	
7.	3;3 - 3;6	4.6	NIL	4.6	25	50	
8.	3;6 - 3;9	3.3	NIL	6.6	20	50	
9.	3;9 - 4;0	9.2	NIL	2.3	21	42	
10.	Above 4;0	13.8	NIL	11	24	33	

The acquisition of voiced aspirated velar /gh/ is low in all age groups. Going through the percentage of all correct response, we find a correlation between the acquisition of /gh/ and age as an important variable. So, the percentage of incorrect response in initial, medial and final position is also taken into account in each age-group.

The chart indicates correct response is nil in group 1, with all the subjects having incorrect response in the three position. In group 2, incorrect responses is 50% in all the three positions, 16.5% in only initial and 6.6% in only the final position. In group 3, correct response is

30%. Incorrect response is 30% in all the three position, 13.2% in only initial and 6.6% in only medial position. In group 4, correct response is 22%. This fall can be attributed to the less number of subjects in this group. Incorrect response is 55% at IMF position, and 7.6% only in initial and 7.4% in only final position. In group 5 the correct response is 54%. Incorrect response is 23% at IMF positions, 7.8% at only initial position and 5.2% at only final position. In group 6, the correct response is 36%. Incorrect response is 28%, 12% in only initial and 4.6% in only medial position. In group 7 acquisition is 50%. Incorrect response is 25% in all three positions, 4.6% in initial and 4.6% in only final positions. In group 8, the correct response is 50%. Incorrect response response is 25% in all three position, 4.6% is only initial and 4.6% in only final position. In group 9, correct response is 42%. Inorrect response is 21% at IMF positions, 9.2% in only initial, 2.3% in only final position. In group 10, correct response is 33%. Incorrect response is 24% in all three position, 13.8% in only initial and nil in the medial and 11% in the final positions.

The chart indicates that the percentage of correct response for /gh/ is low in all the age groups. Most of the children have correct responses in the medial position.

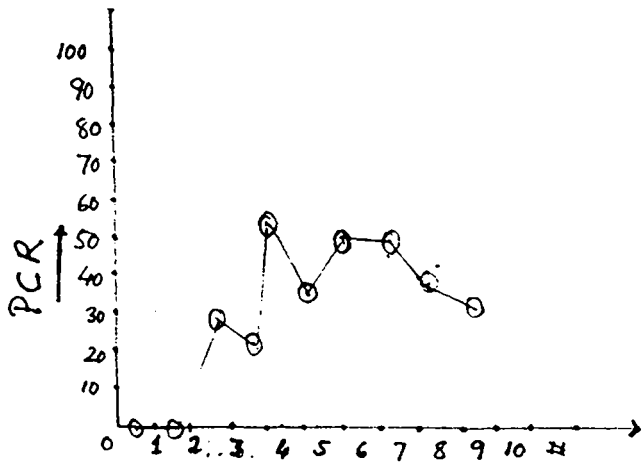
Incorrect responses are more in the initial position incomparison with medial and final position.

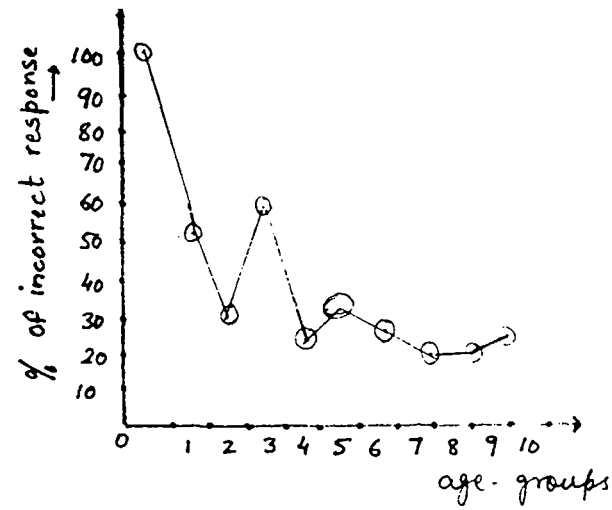
To test /gh/ in the final position, the lexical item /bagh/ was chosen. The first response is invariably /ser/ for /bagh/. Then to elicit the word /bagh/ one has to make an effort. In the process, the child imitates the investigator and therefore, gets the right sound in word final position. But in the single-word response by elicitation method the sound is /g/. /gh/ was substituted with velar /g/ by most of the children in initial medial and final position. /gh/ is also substituted with voiceless /k/ by 15% children for the initial position with some tonal variation.

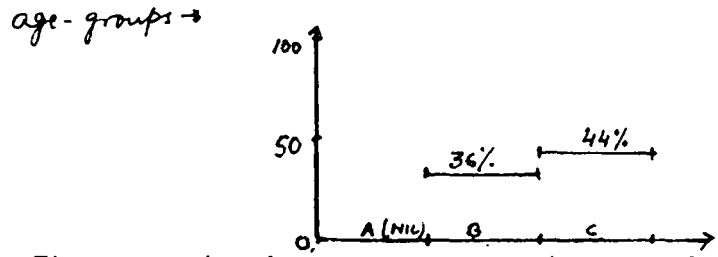
Since /ghɔṛi/ was substituted with /kɔ̀ri/, /gɔ̀ri/, a few more words were given, /ghɔ̀ṛa/ was substitued with /kɔ̀ ṛa/ or /gɔ̀ ra/. Similarly, /ghɔ r/ was substitued with /gɔ̀r/ or /kɔ̀r/ etc.

Since most of the children were from Sikh families, they were familiar with the lexical item /kɔŋgha/. This may be the reason for the correct response of /gh/ in the medial position.

The acquisition pattern that emerges for /gh/ is as shown below:







The graphs indicate that the acquisition for /gh/ starts after the age of 2 yeras and 3 months.The percentage of correct response shows an increase from 0 to 33% (group 1 to 10), though, no definite pattern emerges in between these age-groups. The incorrect response graph shows a fall from 100% to 24% indicating the process of acquisition for /gh/. It also indicates a fall in the incorrect response after the age of 3 years (group 5) when schooling begins for most of the children.

Although the process begins early, /gh/ is acquired generally after the age of 4 years and 4 months. More data is required from children above 4 years so as to show different stages of acquisition of the phoneme /gh/.

Chart no. 29

SOUND /c/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	NIL	2·8	2·8		33		42	/ciṛiya/
2.	2;0 - 2;3	NIL	NIL	NIL		10		90	
3.	2;3 - 2;6	NIL	NIL	NIL		10		90	/kĕci/
4.	2;6 - 2;9	NIL	NIL	3·7		NIL		88	
5.	2;9 - 3;0	NIL	NIL	2·6		NIL		92	/păc/
6.	3;0 - 3;3	NIL	NIL	2·2		NIL		93	
7.	3;3 - 3;6	NIL	NIL	NIL		NIL		100	
8.	3;6 - 3;9	NIL	NIL	NIL		NIL		100	
9.	3;9 - 4;0	NIL	NIL	NIL		NIL		100	
10.	Above 4;0	NIL	NIL	NIL		NIL		100	

The correct response for the voiceless palatal /c/ is 42% in group 1. Incorrect response is 33% in all three positions, 2.8% in medial and 2.8% in only final positions. In group 2, the correct response is 90% while 10% is the incorrect response in all positions. In group 1, only 4 children (out of 12) had incorrect response in initial position and no substitution is found for word initial in the other age-groups. This shows that the sound /c/ is present in initial position in most of the children of the target group. Therefore, it is rapidly acquiured by the children in the later age-groups.

In group 1, the substitution for /c/ is by the dental /t/. In group 2, where only one child has incorrect response, /c/ is substituted by /s/ in all the three positions. In group 3, the result is same as group 2 but the substitution for /c/ is by /t/ by one child. In the group 4, 5 and 6, the incorrect response is found only in the final position (i.e., 3.7%, 2.6% and 2.2%). Each group (4, 5 and 6) has one child each having incorrect response in only final position. The child in group 5 substitutes /c/ with /t/ while children in groups 4 and 6 substitute /c/ by /j/ in the final position. The lexical item for word final position was /pɑ̃c/, which was substituted with /pɔ̃nj/ in group 4 and 6. Since, both /pɑ̃c/ and /pɔ̃nj/ are congnates of Hindi and Punjabi, it may be attributed to one lexical item being substituted with the other, which a child hears more. In the rest of the groups, 7, 8, 9 and 10 the correct response is 100%.

The chart indicates that /c/ is acquired very early by the children of the target group. Since 7% to 10% fall can be attributed to individual variation (as it was only one child in each of these age groups - 2,3,4,5 and 6 with incorrect response), we can say that /c/ is acquired as early as the age of 2 years and 3 months.

Chart no. 30

SOUND /j/

INCORRECT RESPONSES (IN %)

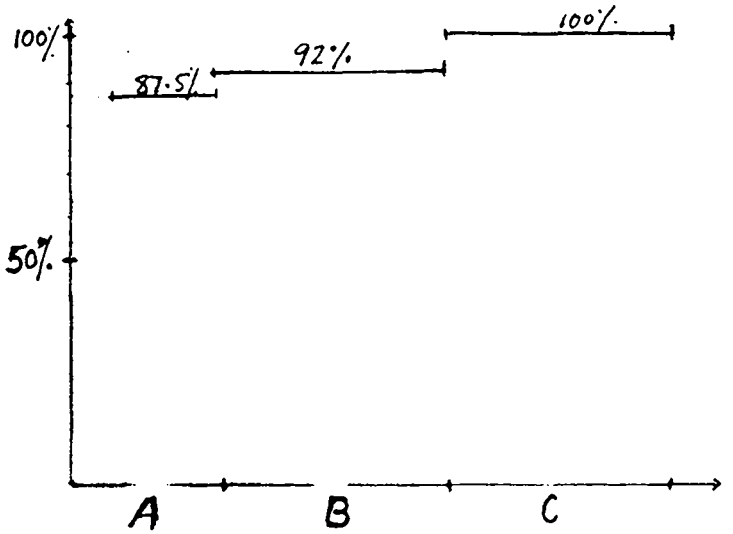
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	25	75	/juta/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	/gajor/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	
4.	2;6 - 2;9	3·7	NIL	NIL	11	77	/surɔj/
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	
6.	3;0 - 3;3	2·3	NIL	NIL	NIL	93	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

Correct response for the voiced palatal /j/ is 75% in group 1. Incorrect response is 25% in all three positions. /j/ is substituted by /d/ in this age group. The correct response reaches 100% in group 2. After group 1, in all the age-groups except group 4 and group 6, we find 100% correct response. This indicates that /j/ is acquired fairly early.

In group 4, fall in the percentage can be attributed to individual variations only, as out of 9 children in this gorup, two subjects substitute /j/ with /d/. Where one child substituted /j/ word initially and one child in all the three positions. These two children have nothing in common

as one is a male child from UMC and the other is a female child from LMC. In group 6, one child out of 15 children substitutes /j/ by /d/, and is a female chid from LMC. These children had overall poor percentage of correct responses. This substitution of /j/ by /d/ could be called idiosycratic. The general pattern for /j/ shows that it is acquired in group 2, i.e., by the age of 2 years and 3 months.

Therefore, acquisition of both the unaspirated palatal sounds /c/ and /j/ is by the age of 2 years and 3 months in the target group.



A = below 2 years to 2 years and 3 months,
B = 2 years and 3 months to 3 years and 3 months and
C = 3 years and 3 months to 4 years and 4 months

Chart no. 31

SOUND /ch/

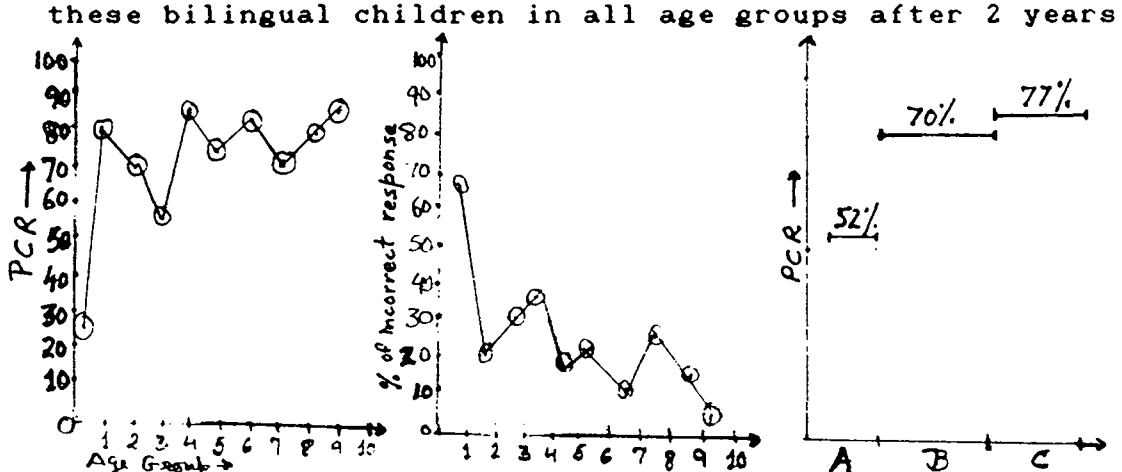
INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	2·8	NIL	NIL	66	25	/chatari/
2.	2;0 - 2;3	NIL	NIL	NIL	20	80	/machali/
3.	2;3 - 2;6	NIL	NIL	NIL	30	70	
4.	2;6 - 2;9	3·7	NIL	NIL	33	55	/müch/
5.	2;9 - 3;0	NIL	NIL	NIL	16	84	
6.	3;0 - 3;3	2·3	NIL	NIL	21	71	
7.	3;3 - 3;6	2·3	NIL	NIL	14	78	
8.	3;6 - 3;9	NIL	NIL	NIL	30	70	
9.	3;9 - 4;0	NIL	NIL	NIL	21	77	
10.	Above 4;0	2·7	2·7	NIL	8	83	

The chart indicates 25% correct response for /ch/ in group 1. Incorrect response is 66% in all three positions, 2.8% in only initial position. In group 2, correct response is 80%. Incorrect response is 20% by all the subjects in all positions. This is primarily due to the imitation method of elicitation. In group 3, the percentage of correct response is 70%. Incorrect response is 30% in all three position. This indicates a fairly high percentage and hence, acquisition of /ch/ by a number of subjects in this age group. After this group the variation is so much that it cannot be explaiend by taking "age" as the only variable. Looking at the substitution pattern in this group and all

other groups, we find that /ch/ is substituted with /š/ in initial, medial and final positions by most of the children except the youngest ones, i.e., under 2 years. Below 2 years the substitution for /ch/ is by /t/. The substitution for /ch/ by /š/ can only be explained at the lexical level. /š/ is an allophonic variant of /ch/ in some dialects of Punjabi. So it is possible that the child is exposed to two sets of words for each one of /ch/ words in their home environment. However, most of the children responded properly when asked to immitate the investigator. So we may conclude that /ch/ is acquired very early i.e., by the age-group 2 years to 2 years and 3 months althogh PCR does not reach 100% even in the oldest group.

We may conclude that /ch/ is acquired as an allophonic variant of /š/ or a free variant of /š/ by a large number of these bilingual children in all age groups after 2 years.



A = below 2 years to 2 years and 3 months,
B = 2 years and 3 months to 3 years and 3 months
C = 3 years and 3 months to 4 years and 4 months

Chart no. 32

SOUND /jh/

INCORRECT RESPONSES (IN %)

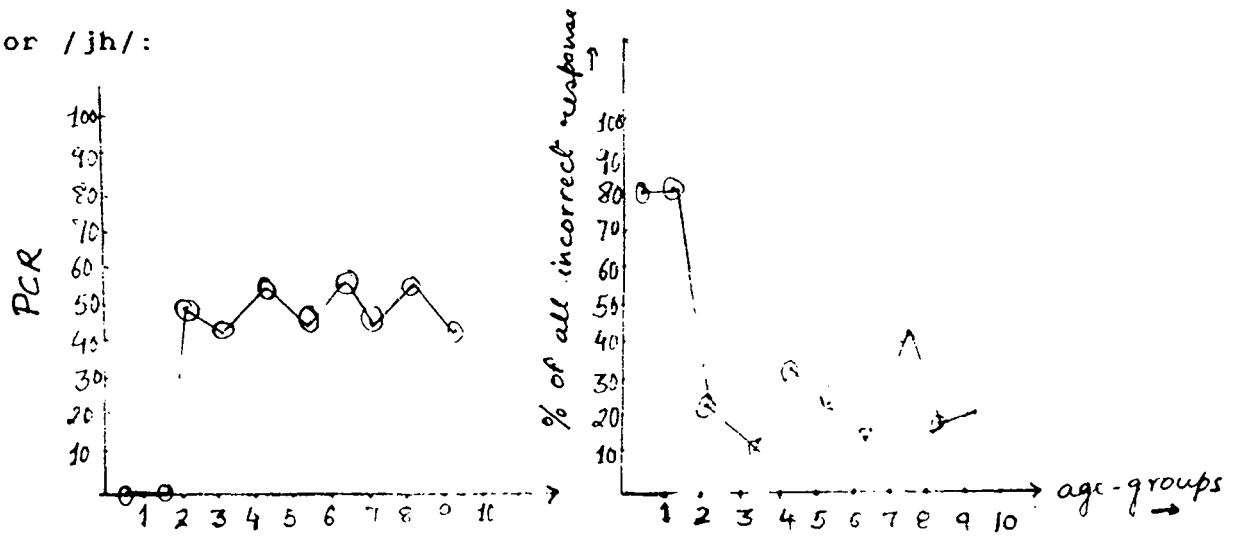
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	5·6	NIL	NIL	80	NIL	/jharu/
2.	2;0 - 2;3	6·6	NIL	NIL	80	NIL	
3.	2;3 - 2;6	9·9	NIL	NIL	20	50	/bojha/
4.	2;6 - 2;9	14·7	NIL	NIL	11	44	
5.	2;9 - 3;0	3·7	NIL	NIL	33	55	/sänjh/
6.	3;0 - 3;3	11·6	NIL	NIL	21	44	
7.	3;3 - 3;6	11·6	NIL	NIL	14	50	
8.	3;6 - 3;9	6·6	NIL	NIL	40	40	
9.	3;9 - 4;0	11·8	NIL	NIL	14	49	
10.	Above 4;0	13·8	NIL	NIL	17	42	

The percentage of correct response of palatal voiced-aspirated sound /jh/ in all age groups does not show any definite pattern, or any correlation with the three variables under this study. So, the percentage of incorrect response in the three positions (initial, medial and final) is taken into acocunt separately and also togather.

The chart indicates that correct response is nil in group 1 and group 2. The figures show that /jh/ is not acquired either by the group 1 or group 2 although some partially correct response are obtained in these two groups. The percentage of correct response is 50% in group 3.

Incorrect response is 20% in the IMF, 9.9% only in initial position. This shows that the acquisition for /jh/ begins at the age of 2 years to 2 years and 6 months. The percentage of correct response is very low in all the other age-groups.

The graphs given below show the pattern of acquisition for /jh/:



The graph showing the incorrect IMF responses shows a fall in the percentage. This is an indication that /jh/ is acquired by many children by the age of 2 years and 6 months. The all correct response graph indicates a rise in the percentage of correct response from 0 (nil) to 42% (from group 1 to group 10). It also indicates that the percentage for correct response in the age-groups after 2 years and 3 months (group 2) to group 10, varies between 40% to 50%. This shows the acquisition of /jh/ by some children in all these groups and partial acquisition by many other children in these groups.

After the age of 2 years and 3 months to 2 years and 6 months most of the children show correct acquisition of /jh/ as a phoneme since the correct response does not reach 100% it indicates that /jh/ is acquired generally after 4 years of age. More data is required from children of 4 years and above also as to see the different statges of acquisition of the phoneme /jh/.

/jh/ was substituted with /j/ or /d/ or /c/ in the initial position by most of the children while it was substituted with /j/ in the medial and final position. 8 children out of 120, substituted /jh/ in initial position by /j/ or /c/ followed by a vowel with some tonal variation.

As no common word was found for medial and final positions, the test words chosen were /bojha/ and /sa̰njh/. The two words are not common in a chid's repertoire, so immitation method of elicitation was used for these words. The response was poor even then for /jh/, word medially, and was practically non-existent in word-final position.

Chart no. 33

SOUND /v/

INCORRECT RESPONSES (IN %)

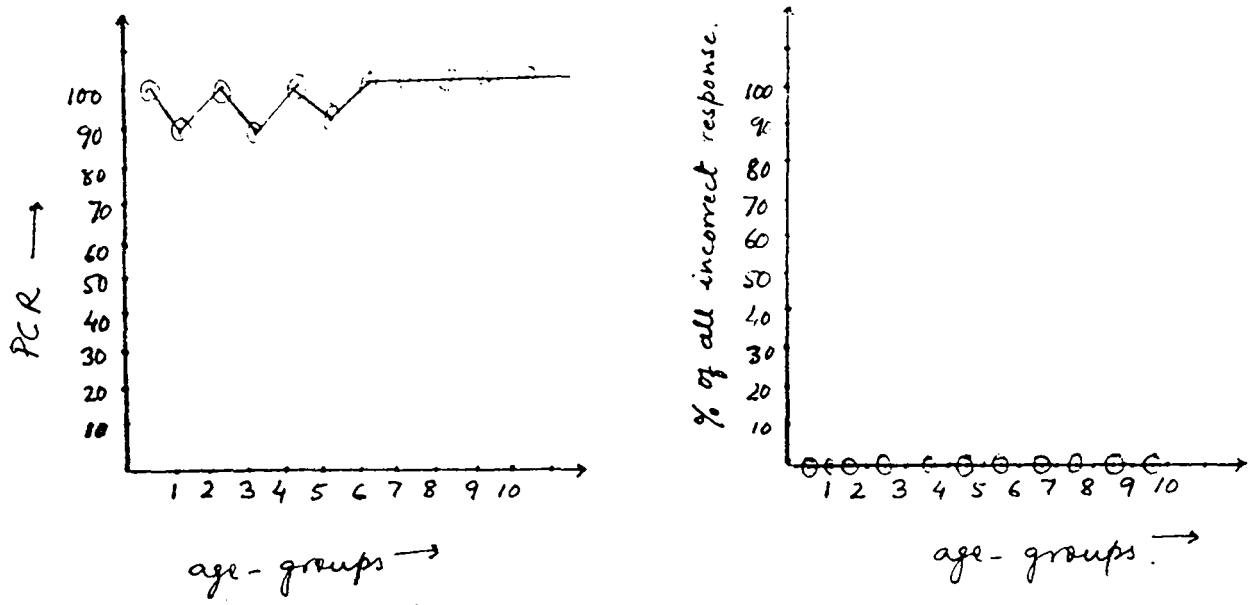
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	NIL	NIL	NIL	NIL			100	/varša/
2.	2;0 - 2;3	NIL	NIL	3·3	NIL			90	
3.	2;3 - 2;6	NIL	NIL	NIL	NIL			100	/caval/
4.	2;6 - 2;9	3·7	NIL	NIL	NIL			88	/hav/
5.	2;9 - 3;0	NIL	NIL	NIL	NIL			100	
6.	3;0 - 3;3	NIL	NIL	2·3	NIL			93	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL			100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL			100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL			100	
10.	Above 4;0	NIL	NIL	NIL	NIL			100	

The correct response for the labiodental fricative /v/ is 100% in group 1. In group 2, the correct response is 90%. Incorrect response is 3.3% in only final position. This incorrect response can be attributed to individual variation as only one child out of 10 children, the child in this group substituted /v/ word-finally by the vowel /o/. Similarly, in groups 4 and 6, the incorrect response of 12% and 7% are because of one child giving incorrect response in both the groups. In group 4, one child out of 9 subjects substituted /v/ by /b/ in the initial position. In group 6, one child out of 15 subjects had /v/ substituted by /o/ in

the final position. The percentage of correct response for /v/ is 100% in all the other age-groups. Incorrect response is nil in all age groups for IMF positions.

Therefore, /v/ is acquired very early by the target group, i.e., before the age of 2 years. The substitution for /v/ by /o/ in the test-word /nav/ is due to the allophonic variations of /v/ and /o/ or /v/ and /w/.

The graphs given below show the acquisition pattern for /v/:



The very fact that the percentage of all incorrect response is zero in all the ten groups shows that

a) /v or w/ is acquired very early and that

b) for the study of the stages of acquisition of /v/ as a phoneme one must have more data from children less than 2 years of age.

Chart no. 34

SOUND /s/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION			MEDIAL	IN ALL THREE POSITION	CR (IN %)	RRECT SPONSE / %)
		I	M	F		I M F		
1.	Below 2;0	2·8	NIL	NIL		33	58	
2.	2;0 - 2;3	NIL	NIL	NIL		NIL	100	
3.	2;3 - 2;6	NIL	NIL	NIL		NIL	100	
4.	2;6 - 2;9	NIL	NIL	7·4		NIL	77	
5.	2;9 - 3;0	NIL	NIL	NIL		NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL		NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL		NIL	100	
8.	3;6 - 3;9	3·3	NIL	NIL		10	80	
9.	3;9 - 4;0	4·6	NIL	NIL		NIL	84	
10.	Above 4;0	NIL	NIL	NIL		8	92	

The correct response for dental fricative /s/ is 58% in group 1. Incorrect response is 33% in all three positions, 2.8% in only initial position. In this group, only 4 children (out of 12) gave incorrect response at all three positions, while one child has incorrect response at initial position only. This indicates that /s/ is present in most of the children's speech of the target group. Therefore, /s/ is acquired rapidly in later age-groups.

THE TEST WORDS ARE : /ʂari/ /pɛsa/ /ghas/

The acquisition reaches 100% in groups 2 and 3. This indicates that /s/ as a phoneme is acquired fairly early in the target group i.e., by the age of 2 years. The percentage of correct response drops to 77% in group 4, where the incorrect response is only in the final position. /s/ is substituted by /š/ in this group. The response is 100% in next three groups (groups 5,6,7). The correct response percentage again drops to 80% in group 8. Incorrect response is 10% in all the three positions, 3.3% in only initial position. /s/ is substituted with /š/ in the initial position by a single child while it was substituted by one child by /ch/ in all the three positions. In group 9, correct response is 84%. Incorrect response is only at initial position where children substitute /s/ with /š/. In group 10, 93% is correct response, while one child out of 12 subjects had incorrect response (8.1%) in all the three positions. /s/ was substituted by /ch/ by this child.

The substitution for /s/ by /š/ is perhaps because the distinction between the two fricatives /s/ and /š/ is not clearly established in some children from the target group. Since /š/ and /ch/ are allophonic variants in some dialects of Punjabi, some children instead of substituting /š/ for /s/ substitute /ch/ for /š/. This indicates that due to confusion between /s/ and /š/, /ch/ is substituted by some children.

/s/ is acquired very early by the children, i.e., by the age of 2 years.

Chart no. 35

SOUND /š/

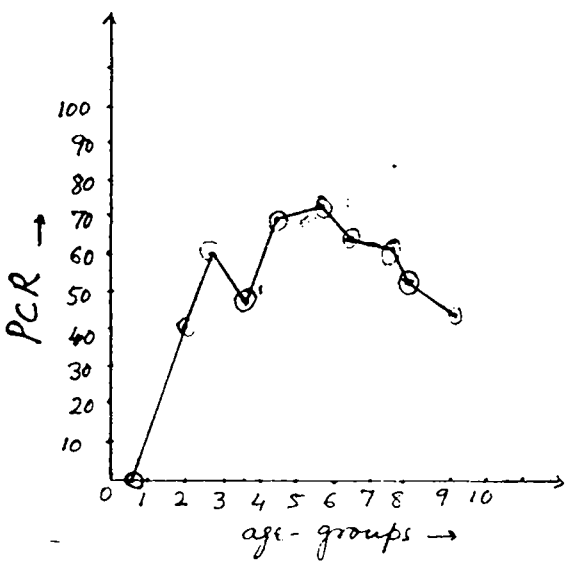
INCORRECT RESPONSES (IN %)

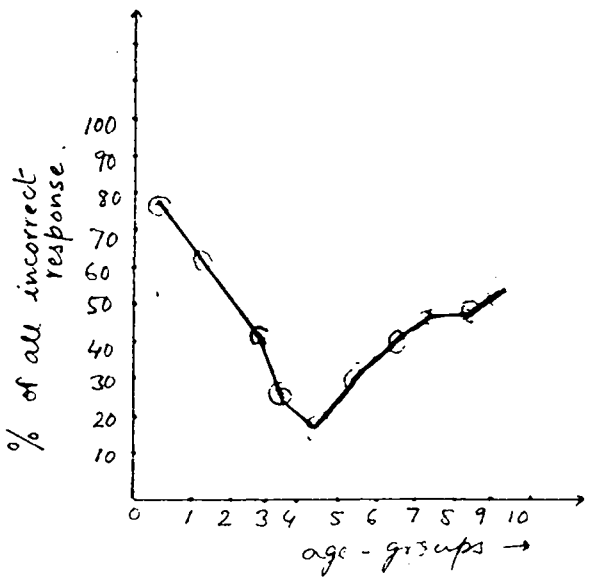
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	5.6	2.8	75	NIL	/šaljem/
2.	2;0 - 2;3	NIL	NIL	NIL	60	40	
3.	2;3 - 2;6	NIL	NIL	NIL	40	60	/mašin/
4.	2;6 - 2;9	NIL	3.7	3.7	22	50	/taš/
5.	2;9 - 3;0	2.3	2.6	NIL	16	69	
6.	3;0 - 3;3	NIL	2.3	NIL	21	71	
7.	3;3 - 3;6	2.3	NIL	NIL	28	64	
8.	3;6 - 3;9	NIL	3.3	NIL	30	60	
9.	3;9 - 4;0	NIL	2.3	NIL	35	56	
10.	Above 4;0	2.7	2.7	NIL	40	42	

The correct response for palatal /š/ is nil in group 1. Incorrect response is, 75% in all 3 positions, 5.6% in only medial and 2.8% in only final position. In group 2, the correct response is 40%, 60% response is incorrect in all positions. In group 3, acquisition is 60%. Incorrect response is 40% in all positions. In group 4, correct response is 50%. Incorrect response is 22% in all positions, nil in only initial, 3.7% in only medial and 3.7 in only final positions. In group 5, the correct response is 69%.

Incorrect response is 16% at all three positions, 2.3% in only initial 2.6% in only medial position. In group 6 correct response drops to 71%. Incorrect response is 21% in all positions, 2.3% in only medial position. In group 7, the correct response further drops to 64%. Incorrect response is 28% in all threer positions, 2.3% in only initial position. In group 8, correct response is 60%. Incorrect response is 30% in all three positions, 3.3% in only medial position. In group 9 the correct response is 56%. Incorrect response is 35% in IMF positions, 2.3% in only medial position. In group 10, correct response drops to 42%. Incorrect response is the most in all three positions i.e., 40% and 2.7% in only initial and 2.7% in only medial position.

The substitution for /š/ was by /s/ or by /ch/. The incorrect response at IMF drops from 75% to 40% (group 1 to group 10), indicting a pattern of acquisition, though there is no definite pattern in between the lower and the upper age-groups.





The all correct response graph indicates that /š/ as a phoneme is yet to be acquired by the children. The substitution of /š/ by /s/ or /ch/ is perhaps because of the distinction between the two fricatives /s/ and /š/ not clearly established in some children, from the target group. Since /š/ and /ch/ are allophonic variants in some dialects of Punjabi, children instead of substituting /s/ for /š/ substitute /š/ with /ch/. Between the substitutes /s/ and /ch/ for the phoneme /š/, /s/ was found more in the children's responses.

More data is required from children above 4 years so as show the different stages of acquisition of /š/ as a phoneme.

Chart no. 36

SOUND /h/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	2·8	NIL	2·8	8	75	/hara/
2.	2;0 - 2;3	NIL	NIL	NIL	20	80	/jahaj/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/mŭh/
4.	2;6 - 2;9	NIL	NIL	3·7	NIL	88	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	2·2	NIL	93	
8.	3;6 - 3;9	NIL	NIL	3·3		97	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

The correct response for the fricative /h/ is 75% in group 1. Incorrect response is 8% in all three positions, 2.8% in only initial and 2.8% in only final position.

In group 2, correct response is 80%. Incorrect response is 20% in all three positions, by 2 subjects out of 10. In the later groups, (i.e., from group 3 to group 10) children acquire /h/ as a phoneme, as the percentage of correct response is 88% to 100% in each age group. In these groups (4,7 and 8), one child from each of these groups has incorrect response. The substitution for /h/ is with a vowel.

Incorrect response for /h/ is mostly in the final position, which can be attributed to the fact that even in the adult speech /h/ in the final position is very uncommon, because of this reason we may look at the figures again. Conclusion can be drawn that /h/ is in fact acquired before the age of 2 years, i.e., the lowest in our target group in the initial and medial position and continues to be so upto the oldest group in our target groups. Word final /h/ in Hindi words like /mə̃h/ and /kɛh, s ɛh and r ɛh/ etc. corresponds to /mə̃ː/ and /kɛ̀, sɛ̀ and rɛ̀ / respectively in Punjabi. For the acquisition of word final /h/ in Hindi one would require more data from such bilinguals in the age of 4 years and above. Perhaps in only through education and

through the written word that the child acquires /h/ in the final position.

Chart no. 37

SOUND /m/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	NIL	100	/mor/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	/pajama/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/am/
4.	2;6 - 2;9	NIL	NIL	NIL	NIL	100	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL	100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL	NIL	100	

The bilabial nasal /m/ has 100% acquisition in all age-groups. None of the subjects have incorrect response at any of the three positions in any age-group. This indicates that once /m/ is acquired, it remains in a child's speech and is not substituted with any other sound in any case. The acquisition of /m/ takes place very early in a child's speech. In order to study the development of /m/ as a phoneme in a child's speech one would require data only from chidlren less than even 1 year and 9 months i.e. the youngest in our target group.

Chart no. 38

SOUND /ɳ/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	2·8	14	NIL	NIL	50	/ɳəl/
2.	2;0 - 2;3	NIL	3·3	NIL	NIL	90	/pani/
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	
4.	2;6 - 2;9	NIL	NIL	NIL	NIL	100	/kaɳ/
5.	2;9 - 3;0	NIL	2·6	NIL	NIL	92	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL	100	
7.	3;3 - 3;6	2·3	NIL	NIL	NIL	93	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL	100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL	100	
10.	Above 4;0	NIL	NIL	NIL			

The correct response for nasal /n/ is 45% in group 1. Incorrect response is 2.8% in only initial position and 14% in only medial position. In group 1, 5 out of 12 children substituted retroflex /ɳ/ for /n/ word medially. This indicates that children below 2 years had difficulty with the lexical item /pani/ and not with the phoneme /n/ as they had correct response for the word /kɔhani/.

In group 2 the correct response is 90%, incorrect response is 3.3% in only medial position, by one child (out of 10 subjects). Substitution was by retroflex /n/. In group 3 and 4, correct response is 100%. In group 5 the percentage of correct response is 92% with incorrect response in only medial position by 2.6% (by one child out of 13 subjects). In groups 6,8,9 and 10 correct response is 100%. The fall of percentage as seen in group 5 and group 7 may be attributed to the individual variations, as one child in group 5 (out of 13) substituted /n/ by /ṇ/ in the medial position and one child in group 7 (out of 15), substituted /n/ by /l/.

/n/ is substituted with /l/ in initial position. /n/ is substituted with retroflex /ṇ/ in the medial position, this can be xplained at the lexical level as the test-word /pani/ is substitued ewith its Punjabi cognate /paṇi/. The 3.3% incorrect response in medial position in group 2 can also be attributed to the substitution at the lexical level and not at the level of phoneme.

Chart no. 39

SOUND /l/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION			CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	NIL	NIL	5.6	NIL			83	/larki/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL			100	/kalam/
3.	2;3 - 2;6	NIL	3.3	NIL	NIL			90	/bal/
4.	2;6 - 2;9	NIL	NIL	NIL	NIL			100	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL			100	
6.	3;0 - 3;3	NIL	NIL	NIL	NIL			100	
7.	3;3 - 3;6	NIL	NIL	NIL	NIL			100	
8.	3;6 - 3;9	NIL	NIL	NIL	NIL			100	
9.	3;9 - 4;0	NIL	NIL	NIL	NIL			100	
10.	Above 4;0	NIL	NIL	NIL	NIL			100	

Correct response for lateral /l/ is 83% in group 1. Incorrect response is nil at all three positions, and 5.6% in only final position. The incorrect response was by only one child out of 12 subjects in this group. /l/ was deleted by this subject, at the medial and final position. In group 2, the percentage of correct response is 100%. In group 3, the fall in percentage of correct response is due to one child (out of 10) deleting /l/ in the medial position.

The chart indicates that acquisition of /l/ is very early i.e. before the age of 2 years. Once /l/ is acquired it remains in the child's speech and is not substituted by

any other sound. None of the children had retroflex /ɭ/ in their speech. The substitution for /l/ was found in only either medial or final position. All the children had /l/ correct in word-initial position. /l/ is deleted in the medial and final position.

The lexical items chosen for word final was /bal/ which was substitued with /val/ by many children. Similarly, for word-initial test word /lɔɽki/ the response was /kʊ ɽi/. Hindi and Punjabi are congnate language, these lexical items were substituted with the lexical items child hears more, at home or outside in his locality. /l/ was found correct word-initially when tested with other words.

Chart no. 40

SOUND /r/

INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, FINAL POSITION			MEDIAL	IN ALL THREE POSITION		CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I	M	F		
1.	Below 2;0	2·8	NIL	NIL	89			NIL	/rel-/
2.	2;0 - 2;3	NIL	NIL	NIL	40			60	/-gari/
3.	2;3 - 2;6	3·3	NIL	NIL	10			80	/suraj/
4.	2;6 - 2;9	3·7	NIL	NIL	11			77	/ʃer/
5.	2;9 - 3;0	5·6	NIL	NIL	7·7			77	
6.	3;0 - 3;3	9·2	NIL	NIL	NIL			71	
7.	3;3 - 3;6	2·3	NIL	NIL	7			86	
8.	3;6 - 3;9	NIL	NIL	NIL	30			70	
9.	3;9 - 4;0	6·9	NIL	NIL	NIL			77	
10.	Above 4;0	NIL	NIL	NIL	NIL			100	

The correct response for the trill /r/ is nil in group 1. The incorrect response in all three positions is 89%. The percentage of correct response rises to 60% in group 2. Incorrect response is, 40% in all three positions. One reason for this sudden change can be attributed to the lexical item chosen for /r/ i.e., /rel/, /surɔj/ and /šer/. These three test-words are in regular use by children. It seems that after the age of 2 years, the /r/-/l/ distinction is established among the children of the target group. Since, the test words are of regular use, children start recognising /r/ as a separate phoneme after the age of 2 years. The percentage of correct response gradually increases from 60% to 100% in groups 2 to 10. This is clear from the graph given below.

The incorrect response indicates a fall from 100% to nil in IMF position. Incorrect response in the three positions separately indicates that /r/ is correctly pronounced in the medial and final positions and most incorrect response is at the initial position.

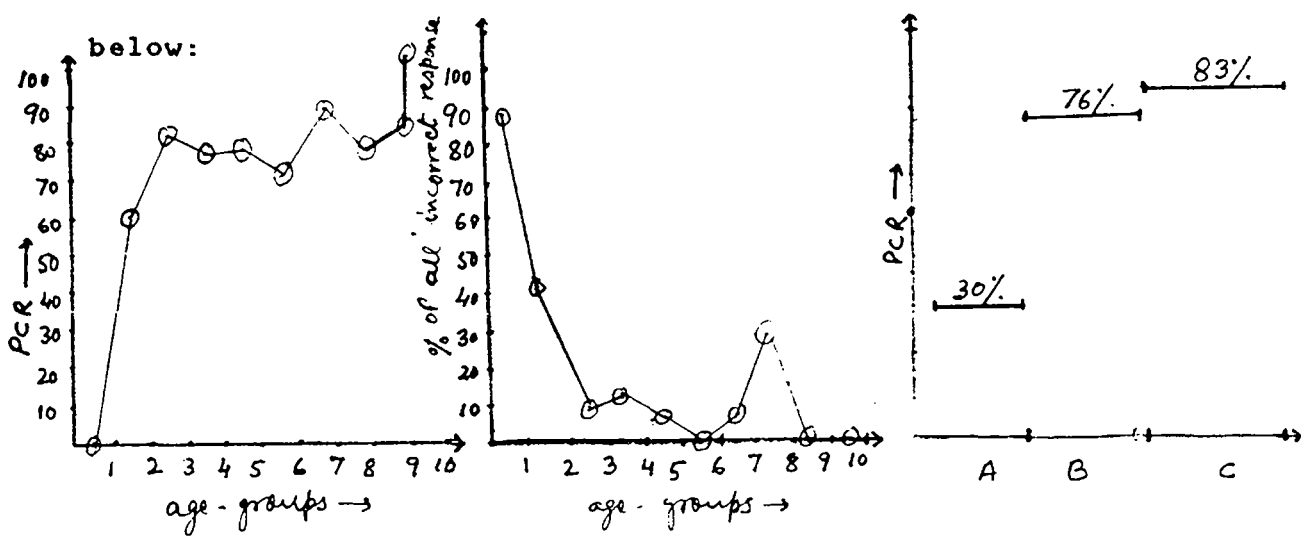
The chart indicates that /r/ has a gradual acquisition pattern. Children in groups 3, 4, 5 and 6 respond in a similar fashion. The average for these 3 groups (i.e., from age-group 2;3 - 2;6 to 3;0 - 3;3) is 76%. In the next three groups two children respond in a similar way. The average

for groups 7,8,9 and 10, (i.e., age groups 3;3 - 3;6 to above 4 years) is 83%. It also indicates that by the age of 2 years and 6 months, children begin to acquire /r/ as a phoneme.

/r/ is substituted mostly with /l/ word initially, with /ɾ/ medially and /l/ word finally. Substitutions with /l/ in medial position were very few in number. /r/ is substituted by /l/ mostly by the children below 2 years and 6 months and /r/-/ɾ/ substitution is present in the children mostly above 2 years and 6 months.

Though /r/ is acquired by all children by 4 years, the distinction between /r/ and retroflex /ɾ/ is still not very clear in their repertoire. As for the word like /reɾi/ the response varied between /reri/, /reɾi/ and /ɾeri/. This aspect needs further investigation by taking more children in the older age-groups.

The pattern of acquisition for /r/ is shown as given below:



The incorrect response at IMF graph indicates rapid fall in IMF from 100% in group 1 to 40% in group 2 and 10% in group 3. The fall goes down to nil in group 10. The graph showing all correct response also indicates a rise from nil (in the lowest age-groups) to 50% (in group 2).

The acquisition of /r/ as a phoneme takes place very early, i.e., by the age of 2 years and 3 months.

Chart no. 41

SOUND /ṛ/

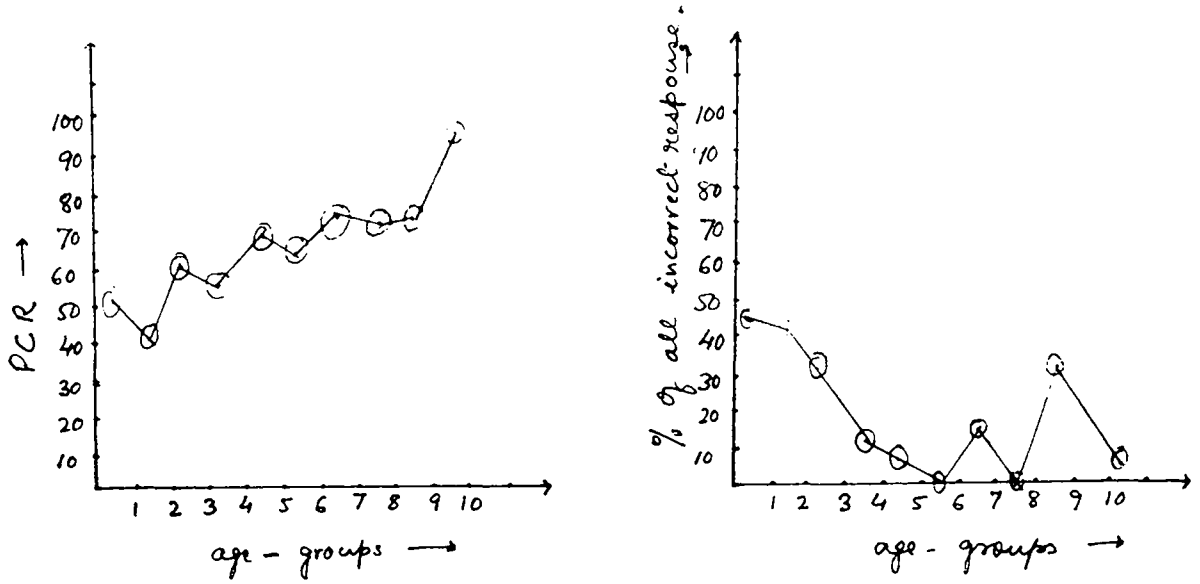
INCORRECT RESPONSES (IN %)

GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION		IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		M	F	I M		
1.	Below 2;0	NIL	2·8	42	50	
2.	2;0 - 2;3	NIL	6·6	40	40	
3.	2;3 - 2;6	NIL	3·3	30	60	/gaṛi/
4.	2;6 - 2;9	7·4	NIL	11	55	/peḍ/
5.	2;9 - 3;0	3·8	5·2	7	69	
6.	3;0 - 3;3	6·9	4·6	NIL	64	
7.	3;3 - 3;6	NIL	4·6	14	71	
8.	3;6 - 3;9	6·6	3·3	NIL	70	
9.	3;9 - 4;0	NIL	NIL	28	70	
10.	Above 4;0	NIL	NIL	8	90	/paṛh/ /paṛho/

No common word was found to test the retroflex /ṛ/ in initial position, so /ṛ/ was tested in medial and final position only.

The correct response in group 1 for /r/ is, 50%. Incorrect response in this group is 41.5% in all the three positions 2.8% in only final position. In group 2 the correct response is 40%. Incorrect response is 40% in all three positions, 6.6% in only final position. After group 2, i.e. from group 3 to group 10, there is a gradual increase in the percentage of correct response. In group 10, the correct response is 90%, and incorrect response is 8% in all the three positions.

The graphs given below gives a clear picture of the pattern of acquisition for /r/:



The incorrect response graph indicates a fall from 42% to 8%. Its also indicating that /r/ is acquired as a phomeme at the age around 2 years and 6 months. The all-correct

response graph shows a gradual increae in the percentage of correct response after the age of two years and 6 months.

Most incorrect response is in the final position where /ɾ/ is substituted with /ɖ/ or by /r/. For medial position also the substitution for /ɾ/ is by /ɖ/ or by /r/.

For many children, the response varied between /r/-/ɾ/ or /ɾ/-/ɖ/ (even for some of those children who had correct response), till the age of 4 years 4 months.

To see whether retroflex flap /ɽh/ of Hindi was present or not in these bilingual children's speech, /ɽh/ was tested along with /ɾ/, in word medial and final positions with words like /pɔɽh/ and /cɔɽhai/ or /pɔɽhai/. Except 2 children (out of 120) of age group 2 years and 6 months to 3 years and 9 months, all other children pronounced these words with /ɾ/ for /ɽh/ for example, /pɔɽho/ it was either /pɔɾo/ or /pɔɖo/.

/ɾ/ is acquired by most of the children by the age of 2 years and 6 months. The correct response in the last group indicates that /ɾ/ is acquired by almost all children by the age of 4 years and above. More data is required from children above 4 years so as to show the different stages of acquisition of the phoneme /ɾ/.

Chart no. /y/

SOUND

INCORRECT RESPONSES (IN %)

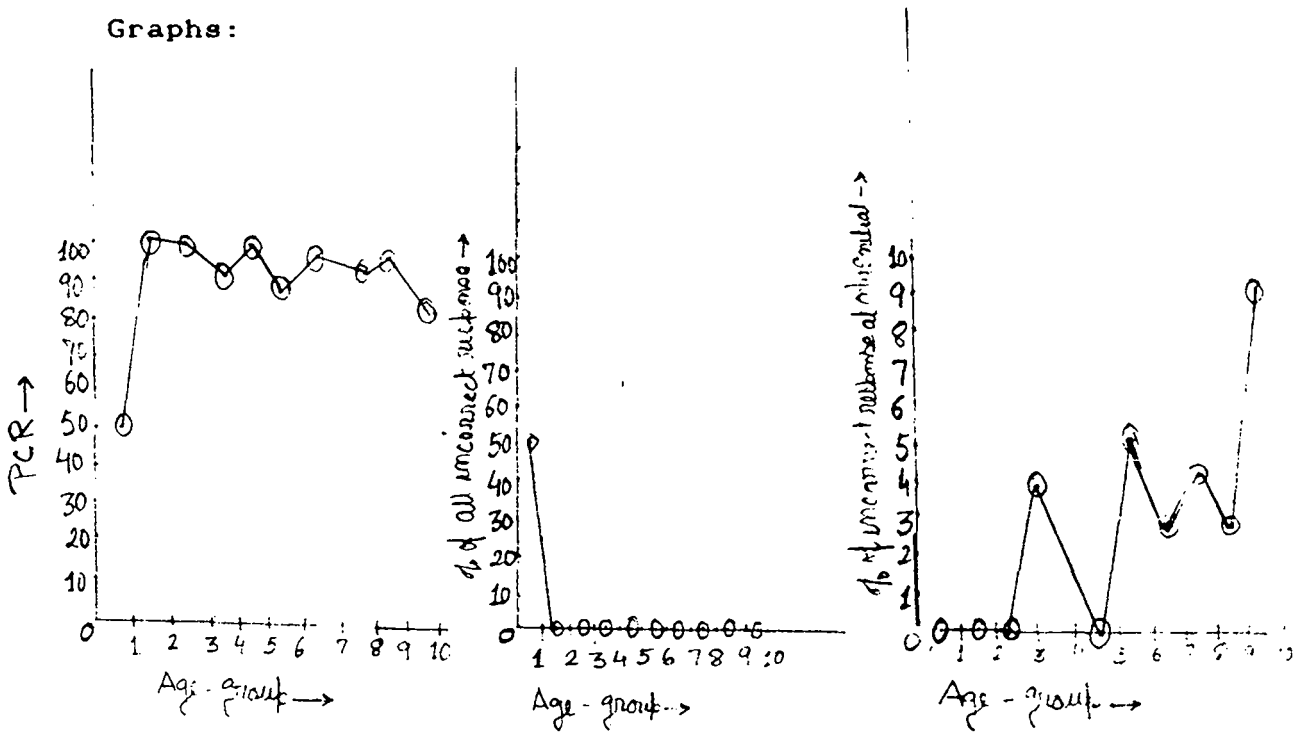
GROUP NO.	AGE-GROUP (IN YEARS; MONTHS)	ONLY IN INITIAL, MEDIAL FINAL POSITION			IN ALL THREE POSITION	CORRECT RESPONSE (IN %)	TEST-WORDS
		I	M	F	I M F		
1.	Below 2;0	NIL	NIL	NIL	50	50	/ye/
2.	2;0 - 2;3	NIL	NIL	NIL	NIL	100	
3.	2;3 - 2;6	NIL	NIL	NIL	NIL	100	/tayər/
4.	2;6 - 2;9	3.7	NIL	NIL	NIL	88	
5.	2;9 - 3;0	NIL	NIL	NIL	NIL	100	/gay/
6.	3;0 - 3;3	4.6	NIL	NIL	NIL	86	
7.	3;3 - 3;6	2.3	NIL	NIL	NIL	93	
8.	3;6 - 3;9	3.3	NIL	NIL	NIL	90	
9.	3;9 - 4;0	2.3	NIL	NIL	NIL	91	
10.	Above 4;0	8.2	NIL	NIL	NIL	75	

The correct response for approximant /y/ is 50% in group 1. The substitution for /y/ in the initial position is by /e/ and /j/ while in medial and final position /y/ is substitued with /e/ and /i/. Incorrect response is 50% in all the three positions. In group 2 and 3 the correct response is 100%. In group 4 correct response drops to 88%. Incorrect response is found in only initial position (3.7%). In group 5, the correct response is 100% again. In group 6, it drops further to 86%. Incorrect response is 4.6% in only initial position. In group 7, correct response is 93% with 2.3% incorrect response in only initial position. In group

8, correct response is 90% with 3.3% incorrect response in only initial position. In group 9, correct response is 91%. Incorrect response is 2.3% in only initial position. In group 10, the percentage of correct response is 75%. Incorrect response is only in the initial position of 8.2%.

The chart indicates that /y/ is acquired very early in a child's speech. After group 4, (i.e., from the age 2;6 - 2;9 to above 4 years) till group 10 the percentage of correct response varies from around 85% to 90% which is fairly high. In all these groups, the incorrect response is primarily in the initial position where /yɛ/ is substituted with its Punjabi cognate /je/. This is because of the fact that in Punjabi speaking homes /ye/ and /je/ both are used in addition to /e/ and /ɛ/ for `this'.

Graphs:



The fall in the percentage is therefore, due to the incorrect response in the initial position. /y/ is acquired very early by the children, i.e., by the age of 2 years.

CHAPTER IV

HYPOTHESES AND DISCUSSION

On the basis of the tabulation and classification of the data certain hypotheses could be formulated. The statement of the hypotheses formulated and their explanations are as follows :

I VOWELS

1. (a) Vowels / ɔ / /a/ /I/ /ʊ/ /e/ /o/ have 100% acquisition in the lowest age-group.

   (b) For the study of the stages of acquisition of these vowels, one must have data from children less than 2 years of age.

Explanation : /ɔ/ /a/ /I/ /ʊ/ /e/ /o/ are acquired very early by the children. There is no way to find out the order of acquisition for these vowels as they were present in children's speech in age group below 2 years.

2. /E/ is acquired in group 2.

Explanation : /E/ has 75% correct response in group 1 (age group below 2 years) 25% of the substitutions are with vowel /e/. In group 2 (age group 2 years to 2 years and 3 months) and above the percentage of correct response is 100%.

3. The /I/ and /i/ contrast, and /ʊ/ and /Ʊ/ contrast is acquired by the age of 2 years 3 months.

Explanation : For /i/ and /u/, the correct responses were 75% in group 1. /i/ and /u/ are substituted with /I/ and /ʊ/ respectively. The acquisition reaches 100% in group 2.

Exceptions: In some cognates, where long vowel of Hindi corresponds with the corresponding short vowel +(plus) geminate of Punjabi, indicate the occurrence of both long and short vowels in a child's repertoire. The substitution of long vowels in the test words by short vowels shows the substitution of a lexical item by another in the words like:

/sikh/ /sIkh/

/ʊ̃t/ /uṭth(ə)/

4. The acquisition of vowel /ɔ/ is very low in all age-groups.

Explanation : Vowel /ɔ/ has the correct response ranging from 20% to 30% till group 9 (age-group 3;9-4;0). In the age-group above 4 years (i.e. 4;0 - 4;4) the correct response is 50%. Vowel /ɔ/ is perceived as an allophonic variant of vowel /o/ by most of the Punjabi speakers. So the children do not acquire /ɔ/ as a separate phoneme, thus resulting in lower percentage of responses in all age-groups. This can also be attributed to the fact that in

their home environment, especially in the use of Punjabi language one does find the substitution of /ɔrət/ by /orə t/ /t ɔ fi/ by /tafi/. The increase in the correct responses in group 10, can be attributed to schooling, that begins for most of these children around 3 years to 3 years-6 months. The pattern of acquisition for /ɔ/ needs to be further investigated by taking data from children above 4 year and 4 months of age. Needless to say, for those higher age-groups we would need to keep in mind the other factors and variables as well.

II TONES :

1. Tonal contrasts of Punjabi are yet to be acquired

Explanation : No direct test was administered to test tonal variation in Punjabi. Almost all the voiced-aspirated test-sounds had some tonal variation by most of the children in the initial syllable. Correct responses for voiced - aspirates in the initial position was as low as 21%. In the rest of the 71% responses, one finds substitution of the following kind :

/bhalu/ as /bălu/ or /bhălu/ or /pàlu/

/dh nus/ as /d̆ə nuš/ or /də̀ nuš/ or /tə̀ nus/

/ḍholə k/ as /ḍŏlə k/ or /ḍhŏlə k/ or /ṭòlə k/

/ghoṛa/ as /gŏṛa/ or /kòṛa/ or /ghòṛa/

/jharṛU/ as /jăṛU/ or /càṛU/ or /jhàṛU/

Based on these responses one can conclude that the tonal patterns which a monolingual Punjabi child generally acquires fairly early is yet to be acquired properly by these bilingual children. For the order of acquisition of tonal phonemes by bilingual child one has to go beyond the age of 4 years 4 months, which was the highest in our sample.

Consonants are arranged according to the order of acquisition by the children of the target group. (As indicated in the chart no 43 on page *188* in chapter 5)

III CONSONANTS

1. (a) /p/ is acquired very early by the children of the target group.

   (b) For the study of the stages of acquisition of /p/ as a phoneme one must have more data from children less than 2 years of age.

Explanation : The acquisition of the voiceless unaspirated bilabial stop /p/ is 100% even in group 1, i.e., before the age of 2 years. Once /p/ is acquired it remains constant in the child's speech and is not substituted by any other sound in any position; initial, medial or final.

2. (a) /t/ is acquired very early by the children of the target group.

(b) For the study of the stages acquisition of /t/ as a phoneme one must have more data from children less than 2 years of age.

Explanation: The acquisition of dental /t/ is 100% even in group 1. Once /t/ is acquired it remains constant in the child's speech and is not substituted by any other sound in any positions.

3. (a) /v/ is acquired very early by the children of the target group.

(b) For the study of the stages of acquisition of /v/ as a phoneme one must have more data for children less that 2 years.

Explanation: The acquisition of the fricative /v/ is 100% even in group 1. Once /v/ is acquired it remains constant in a child's speech and is not substituted by any other sound in any positions.

4. (a) /m/ is acquired very early by the children of the target group.

(b) For the study of the stages of acquisition of /m/ as a phoneme one must have more data for children less that 2 years.

Explanation: The acquisition of the fricative /m/ is 100% even in group 1. Once /m/ is acquired it remains constant in a child's speech and is not substituted by any other sound in any positions.

5. /b/ is acquired in group 2, i.e. by the target group i.e., by the age of 2 years to 2 years and 3 months.

Explanation: Bilabial voiced /b/ is acquired in group 2. In group 1, (i.e. below 2 years) the incorrect response is by 2 children in the initial position. Since only 2 children out of the total 120 children of the target group were found having incorrect response, this may be taken as an exception. Once /b/ is acquired, it remains constant in a child's speech and is not substituted by any other sound in any of the three positions

6. /d/ is acquired in group 2 i.e. by the age of 2 years to 2 years 3 months.

Explanation: Dental /d/ is acquired in group 2. In group 1 (age group, below 2 years) incorrect response is 83%. Two children in this group had incorrect response at initial and final position. Since only 2 children out of the 120 from the target group were found having incorrect response, this may be taken as an exception.

Once /d/ is acquired, it remains constant in the child's speech and is not substituted with any other sound in any of the three positions.

7. /l/ is acquired in group 2, i.e., by the age of 2 years to 2 years 3 months.

Explanation: Lateral /l/ is acquired in group 2. In group 1 (age-group below 2 years) correct response is 83%. One child from this group has incorrect response in the medial position and one child has it in the final position. SInce only two children about of 120 from the target group were found having incorrect response, this may be taken as an exception.

Once /l/ is acquired, it remains constant in the child's speech and is not substituted with any other sound in any of the three positions.

8. /n/ is acquired in group 2 i.e. by the age 2 years and 3 months.

Explanation : Nasal /n/ is acquired in group 2. In group 1, the percentage of correct response is 50%. Children in this group had incorrect response mostly in the medial position. This was mainly due to the choice of the lexical item /pani/ which was substituted with its Punjabi cognate, /paṇi/. In group 2, also as only one child had substituted /n/ word-

medial, we can conclude that these incorrect responses are due to choice of the lexical item.

/n/ is acquired as early as the age of 2 years and 3 months.

9. **/s/ is acquired in group 2, i.e. by the age 2 years and 3 months.**

Explanation : Fricative /s/ is acquired in group 2. In group 1 the percentage of correct response is 58%. The correct response is 100% in group 2, 3, 5, 6 and 7. The percentage is slightly low in the groups 4, 8, 9 and 10.

This fall in percentage is mainly because, the distinction between the two fricatives /s/ and /š/ in some children's speech from the target group.

10. **/j/ is acquired in group 2, i.e. by the age of 2 years to 2 years 3 months.**

Explanation : /j/ is acquired in group 2. In group 1. The percentage of correct response is 75%. This rise to 100% in all the other groups except group 4 and group 6. In group 4, the children with incorrect response had overall poor response while group 6 had only one child with incorrect response.

11. (a) /y/ is acquired in group 2 i.e., by the age of 2 years 3 months.

(b) For the study of the acquisition of word final /y/ in Hindi, one would require more data from such bilinguals in the age of 4 years and above.

Explanation: /y/ is acquired in group 2. In group 1, the percentage of correct response is 50%

In group 2, correct response reaches 100%. The correct response is 100% in group 3, and group 5. The percentage of correct response is slightly low in the other groups. The fall is due to the incorrect response in the initial position where the chosen lexical item /ye/ was substituted with its Punjabi cognate /je/.

12. /ṭ/ is acquired in group 3, i.e. by the age of 2 years 3 months to 2 years and 6 months.

Explanation : Retroflex /ṭ/ is acquired by the age of 2 years and 3 months. Though the percentage of correct response reaches 100% in group 9 & 10, this percentage is very high in all the other groups, except for group 1 where some correct responses are indicated. Except for a few children substituted /ṭ/ by /t/, /ṭ/ is acquired fairly early by most children.

13. /g/ is acquired in group 3, i.e.by the age of 2 years & 3 months to 2 years and 6 months.

Explanation: Velar /g/ is acquired by the age of 2 years and 6 months. The acquisition begins in group 2 (i.e. by the age of 2 years) and reaches to 90% in group 3. In group 3 and group 4, only one child had incorrect response. In later groups the percentage of correct response is 100%. Since, there is only one child in groups 3 and group 4 with incorrect response at IMF positions we may take them as exceptions.

14. /c/ is acquired is acquired in group 2, i.e. by the age of 2 years & 3 months.

Explanation: Palatal /c/ is acquired by group 2, as there is only one child in group 3 who has incorrect response at IMF positions. In groups 4, 5 and 6, one child in each group has incorrect response at the word final /c/ who substitutes the lexical item chosen /pẵc/ by its Punjabi cognate /pɔ̃ nj/.

15. (a) /h/ is acquired fairly early in the initial and medial position and continues to be so upto the oldest group in our target group.

(b) For the study of the acquisition of word final /h/ in Hindi, one would require more data from such bilinguals in the age of 4 years and above.

Explanation : /h/ is acquired fairly early i.e. even in the lowest group of our target group. Incorrect response for /h/ is mostly in the final position, which can be attributed, to the fact that in adult speech too, in Delhi, /h/ in the final position is uncommon. Therefore, to study /h/ in the final position, more data is needed from children above 4 years.

16. (a) Acquisition of /r/ as a phoneme begins fairly early is by the age of 2 years 3 months.

(b) The acquisition for /r/ is gradual and it reaches 100% in the age group 4 years to 4 years and 4 months.

Explanation: (a) The correct response for /r/ is nil in group 1 due to the substitution of /r/ by /l/. The percentage of correct response rises gradually as /r/ - /l/ distinction crystallizes by the age of 4 years. Most incorrect responses were indicated in the word initial for /r/ in all age groups.

(b): In group 2, the percentage of correct response is 60% whereas the incorrect response at IMF is 40%, this falls to 10% in group 3. This fall at IMF position indicates that the acquisition for /r/ begins by the age of 2 years 3 month.

17. (a) /r/ is yet to be acquired fully by the target group.

(b) Acquisition for /r/ begins early around the age of 2 years and six months.

Explanation: (a) Since the distinction between /r̤/-/r/ and /r̤/ - /d̤/is not established in the target group the percentage of correct response does not reach 100%. More data is required from the children above 4 years, so as to see the different stages of acquisition of /r̤/

(b) The PCR for group 3 (i.e., age group 2 years 3 months to 2 years 6 months) is 60%, where as the incorrect response at medial and final position (MF) is 30%. In group 4, the incorrect response at MF falls to 11%. This fall indicates that the acquisition for /r̤/ begins from group 3. In groups 1 and 2 the incorrect response at MF are 42% and 40% respectively.

18.

(a) The acquisition for /d̤h/ begins early around the age of 3 years 6 months

(b) /d̤h/ is yet to be acquired fully by the target group.

Explanation: (a) The incorrect responses at IM positions from group 1 to group 6 is fairly high, ie. 80% to 35% in these groups and it goes down to 7% to nil in 7,8,9&10 groups. While the percentage of correct response is 64% in group 7, this indicates that the acquisition for /ḍh/ begins much earlier even though it does not reach 10% even in the oldest group.

(b) The percentage of correct response for /ḍh/ does not reach 100% in the oldest age group of our target group. But the all incorrect responses goes down from 80% to nil. which indicates that some children tend to substitute /ḍh/ either in the initial position or in the medial position, thereby indicating partial acquisition of /ḍh/

19.

(a) The acquisition for /k/ begins by the age of 2 years & 3 months.

(b) Velar /k/ is get to be acquired fully by the target group.

Explanation (a): The percentage of incorrect response in group 1 and 2 are 66% and 40% respectively. The correct response for /k/ in group 3 is 80% and incorrect response at IMF is mil. THe percentage of correct response increases to 88% in group 4 and the incorrect response at IMF is nil. From groups 3 onwards the percentage of incorrect response

remains low. This indicates that acquisition for /k/ begins by the age of 2 years 3 months to 2 years and six months, even though it does not reach 100% even in the oldest age group.

(b) All incorrect response for /k/ falls from 66% to 8% which indicates that some children tend to substitute /k/ either in initial or medial or final position, thereby indicating partial acquisition of /k/.

20. /ch/

(a) The acquisition of /ch/ is gradual and is yet to be fully acquired till group 10 by the target group.

(b) /ch/ as an allophone of /š/ is acquired fairly early i.e., group 2 onwards.

Explanation (a): The acquisition of the palatal /ch/ shows a gradual increase in the percentage of correct response in the children as they grow up. The correct response in the lowest age-group is 25% while it is 83% in the oldest age-group.

Explanation (b): Substitutions of /ch/ by /t/ or /th/ by children under 2 years indicates that /ch/ is still not properly acquired by most of the children who are less than 2 years of age. Substitution of /ch/ by /š/ in older

children i.e., of 2 years and 3 months and above indicates the influence of their bilingual background. This is especially so, if the Punjabi spoken at home in case of these children, has /ś/ as a phoneme and /ch/ is only an allophonic variant of /ś/.

21. /th/

(a) The acquisition of /th/ starts after the age of 2 years and 3 months.

(b) /th/ is yet to be acquired fully by the target group.

Explanation (a): The percentage of correct response for /th/ in group 1 is 50% and for incorrect response at IMF is 33%. In group 2 the percentage of correct response is 60% and incorrect response at IMF is 20%. The incorrect response is further low in other groups except for group 8. This indicates that acquisition for /th/ begins from the age of 2 years to 2 years and 3 months, even though it does not reach 100% in the oldest age group.

(b) The acquisition for /th/ does not reach 100%, PCR is 75% in the oldest group. Children tend to substitute more after the age of 3 years. The substitution of /th/ is by phoneme /t/. But the all incorrect response goes down from 33% to 8% indicating partial acquisition for /th/ So, more

data is required from children above 4 years so as to see the different stages of acquisition of /th/.

22. /ḍ/

(a) The acquisition for /ḍ/ is gradual.

(b) Retroflex /ḍ/ is yet to be acquired fully by the target group.

Explanation (a): The percentage of correct response for /d/ is 25% and incorrect response at IMF is 50% in group 1. The percentage of correct response increases to 60% in group 2, whereas incorrect response at IMF falls to 20%. This indicates that the acquisition for /ḍ/ begins early around by the age of 2 years to 2 years and 3 months and the acquisition process is gradual.

Explanation (b): For /ḍ/ the percentage of correct response does not reach 100% even in the oldest age group, the PCR is 75% in the oldest age-group. This indicates that some children tend to substitute /ḍ/ by /d/ in all the age-groups till group 10, but the all incorrect response falls from 50% to 8% partial acquisition for /ḍ/ More data is required from children above 4 years and 4 months.

23. /ṭh/

(a) The acquisition for /ṭh/ begins early around the age of 2 years to 2 years and 3 months.

(b) /ṭh/ is yet to be acquired fully by the target group.

Explanation (a): The percentage of correct response in group 1 is nil, incorrect response is 100% at IMF position. In group 2, percentage of correct response is 60%. The incorrect response at IMF falls to 30%. This indicates that the acquisition for /ṭh/ begins by the age of 2 years to 2 years and 3 months.

Explanation (b): The percentage of correct response 100% even in the oldest age-group as children from age-group 2 years and 3 months onwards have incorrect responses in the initial position only. This is due to the influence of their bilingual background as it was not always substituted by /ṭ/ or /th/. Instead many children opted for a Punjabi cognate word for the test-word /ṭhela/. The all incorrect response falls from 100% to 14% indicating partial acquisition of /th/.

24. /kh/

(a) Acquisition for /kh/ begins in group three by the age of 2 years and 3 months to 2 years and 6 months.

(b) /kh/ is yet to be acquired fully by the target group.

Explanation (a): The percentage of correct response and the incorrect response at IMF positions, suggest that /kh/ is acquired as a phoneme by a number of children by the age of 2 years and 3 months to 2 years and 6 months.

(b): From group 3 onwards the percentage of incorrect response in IMF position is low 20% to 8% (in group 3 to group 10) The incorrect response at the three positions indicate that children have more substitutions in either of the three positions but, as the all incorrect response indicate a fall from 75% to 8%, it shows the partial acquisition for /kh/. Hence, the percentage of correct response does not reach 100%. More data from the children above 4 years is required for the study of /kh/.

25. /jh/

(a) Acquisition for /jh/ begins early around the age of 2 years and 6 months.

(b) /jh/ is yet to be acquired fully by the target group.

Explanation (a): The percentage of correct response is nil in groups 1 and 2. The percentage of correct response is 50% in group 3, whereas the incorrect response at IMF position is 20%. The incorrect response at IMF in group 4 falls to 11% in group 4. This indicates the beginning of the

acquisition of /jh/ early by the age of 2 years and 3 months, though it does not reach 100% in the oldest group.

(b) The percentage of correct response for /jh/ varies from nil to 55% in all the ten age groups. These shows that /jh/ is one of the sounds which is acquired after the age of 4 years by these bilingual children. The all incorrect response falls from 80% to 17% indicating partial acquisition of /jh/. More data is required from children of 4 years and above so as to show different stages of acquisition of /jh/.

26. /š/ is yet to be acquired by the target-group

Explanation: The incorrect response at IMF position drops from 75% to 40% from group 1 to group 10, which indicates that some children tend to substitutde /š/ till group 10, indicting that acquisition of /š/ begins by the age of 2 years. The all incorrect response indcates a pattern of acquisition, though there is no definite pattern in between the lower and the upper age groups. In even upper age groups the distinction between the two fricatives /š/-/s/ is not clearly established, therefore no specific pattern of acquisition for /š/. It needs to be further investigated by taking data from children above 4 years.

27. /dh/ The acquisition pattern for /dh/ is still emerging.

Explanation: The voiced aspirated /dh/ has a very low percentage of correct response in all the age groups. The percentage of correct response is nil to 32% in the groups 1 to 10. The all incorrect responses drop from 100% to 24% indicating the partial acquisition for /dh/. The percentage of correct response and the percentage of incorrect response indicates that /dh/ is acquired generally after 4 years of age. More data is required from the children above 4 years of age to study the stages of acquisition for /dh/.

28. /gh/ The acquisition pattern for /gh/ is still emerging.

Explanation: The percentage of correct response for the voiced aspirated /gh/ is very low in all age groups. The PCR does not reach 100% even in the oldest age group but the incorrect response falls from 100% to 24%.From group 3 onwards, the PCR increases while the percentage of incorrect response falls., This indicates that the acquisition for /gh/ begins at the age of 2 years and 3 months. The percentage of correct response shows increase from nil to 33% from group 1 to group 10. This indicates that /gh/ is acquired generally after 4 years of age. More data is required from the children above 4 years to study the different stages of acquisition for /gh/.

29. /ph/ The acquisition pattern for /ph/ is still emerging.

Explanation: The percentage of correct response for /ph/ is very low in all age-groups. This is due to the fact in adult speech in Delhi, children are never exposed to the correct pronunciation for /ph/. The percentage of correct response indicates that /ph/ is one of those sounds that are acquired fairly late at least not until the age of 3 years and 6 months, when schooling begins.

More data is required so as to study the different stages of acquisition for /ph/ by taking children above 4 years.

30. /bh/ The acquisition pattern for /bh/ is still emerging

Explanation: The percentage of correct response for voiced aspirated /bh/ is very low in all age groups. The percentage of correct response varies between nil to 17% from groups 1 to group 10. All correct response show a definite correlation between the acquisition of /bh/ and age. It shows that only after the age of 3 years, some children show the correct acquisition of /bh/ as a phoneme, even if the percentage of correct response is as low as 7% or 17%. This also indicates the influence of their bilingual background.

This indicates that more data is required from children from the age 4 years and above so as to show different stages of acquisition of /bh/.

CHAPTER - V

SUMMARY AND CONCLUSION

Studies in the field of child language acquisition dates back to well over hundred years. Since then it has seen considerable changes. It is becoming broader in scope, richer in contents and is still developing rapidly.

Language acquisition was first studied by the method of 'Diary Studies', which is of enormous importance, they still continue to serve as a source of data for other studies. 'Diary Studies' though still continue, a change in methodology was seen after the world war I. The emphasis then, shifted mainly on 'behaviourism'. By 1957, another change was noticed in methodology, and this period continues till today. It is called 'Longitudinal Sampling' by Ingram.

Jakobson's work in the field of acquisition is a landmark. He proposes that child learns to make various distinctive features in a developmental sequence, the consonant-vowel distinction being learned first. Rarely used distinctive features in language are learnt last of all.

Previous studies on 'child language acquisition' were based either on children brought up in monolingual environment or on children brought up in a bilingual

environment, where they learn or acquire the second language depending upon different domains. The present study concentrates on children brought up in an environment where they are exposed to two languages at the same time and in all domains of language use.

The target group selected was of 120 children coming from Punjabi families residing in Delhi, where practically every member of family is a bilingual. Hindi and Punjabi are used in all the domains of language use and in the home environment as well. So, the child is exposed to Hindi and Punjabi both, at home and outside. The emphasis was on the phonological development of these bilingual children.

The study was based on the 'behavioural model' certain changes were made in the existing models and tests to suit the present study. As the study was to be conducted upon bilingual children, phonemes of both Punjabi and Hindi were discussed, compared and summed up. These summed up phonemes were tested. They were arranged according to the 'Articulation Test-chart' (used in speech and hearing clinics) and some changes were incorporated to suit the study. The test sounds were tested in all the three phonological positions i.e. word initial, word medial, and word final. The selection of test-word was made keeping in mind the meaninful words common to both the languages.

These test-words were presented in the form of picture cards. For data collection, two methods were used:

1 Elicitation method,

2 Imitation method.

The response was carefully noted and the substitutions were also marked and noted.

The analysis of the data collected was done on the basis of charts made. The percentage of correct responses (PCR) were calculated along with the percentage of incorrect responses at all the three different position: initial, medial, final as well as IMF postion. The charts were made on the basis different variables, under which we have divided the target group. These variables are:

(a) Age,

(b) Sex.

(c) Class

The three variables combined together did not produce any definite correspondence with the percentage of correct response, so each of them were analysed separately. During the analysis of the data, 'age' was found to be the most important variable in this study. In order to study the other two variables we need to have larger groups of male and female children in every age group and also a larger data base from each one of the two classes.

However, some tentative conclusions can be drawn from the overall pattern that emerges when we look at the class/sex data in all groups combined for all the sounds together. These tentative conclusions are :

1. **(a)** The percentage of correct response for the total number of male children was 75% and that for the female children was 73%.

(b) The difference in percentage of correct response between male and female children is negligible in all age-groups except for groups 5 and 10, where there is only marginal difference. This difference in group 5 is of 8% (Male 77% and Female 85%) whereas it is 10% in group 10 (Male 85% and Female 75%).

Although girls were found to be more extrovert and talkative, there is statistically insignificant difference in the acquisition pattern of male and female children.

2. **(a)** The percentage of correct response for total no. of UMC children is 76.6% and LMC is 73.5%.

(b) (1) There is a sharp rise in the percentage of correct response for both groups (UMC & LMC) in group 2 (i.e. 2 years to 2 years and 3 months) from group 1 (i.e. below 2 years).

(2) As the age group increases the percentage of correct response by LMC increases more rapidly than UMC except in groups 6 and 7.

(c) Children from LMC indicate an increase in percentage of correct response after their exposure to the school environment. The percentage of correct response by the pre school UMC children is 76% whereas that for LMC is 67%. After their exposure to school environment the percentage of correct response by UMC is 78% whereas that by LMC children is 85%.

Thus the conclusion may be drawn that children from LMC indicate an increase in percentage of correct response after their exposure to the school environment i.e. after three years or three years and six months.

So, as stated earlier for a definite correspondence to emerge one must look at every age group more closely with large groups of male/female or UMC/LMC children in each group.

Age emerges as the most important variable as discussed the following sections.

This study on bilinguals indirectly supports Jakobson's proposals especially pertaining to the initial stages of acquisition. Consonant-vowel distinction are learnt first.

The sounds that are common to both the languages (Hindi and Punjabi), are acquired the earliest and the sounds which are found either in Punjabi or in Hindi are acquired later. Looking at Jakobson's phonological triangles (as discussed on page no. 6, Chapter I), we find that children from the target group had already acquired most of the phonological oppositions suggested in Jakobson's four triangles. The phonological oppositions of /a/-/p/, /a/-/i/, /p/-/m/, /p/-/t/ and /a/-/u/ were present in the lowest group (i.e. 1 year 9 months to 2 years) of our study. So, there is no way to see the order of the acquisition of these oppositions as they were already acquired by the target group. The only phonological opposition not acquired by the lowest age-group was the opposition of dental-velar sounds, as none of the velar sounds tested (/k/ /kh/ /g/ /gh/) were present in this age-group. The acquisition of these sounds begin after the age of 2 years. Leopold's (1947) daughter also had difficulties in acquiring the velar stops.

Studies conducted by Velten (1943) and Leopold (1947) (both on a single bilingual child) found that the phonemic contrasts present in their daughter's speech were less as compared to monolingual children. In our study, this was not the case as phonemic contrasts for many of the sounds were acquired by the age of 2 years. The sounds acquired by the target group, by the age of 2 years is much more as

compared to Leopold's study. The sounds acquired at this age are: /ə/ /a/ /i/ /I/ /e/ /E/ /ʊ / /u/ /o/ /p/ /t/ /v/ /m/ /b/ /d/ /l/ /n/ /c/ /j/ /h/ /y/.

Ferguson and Farewell (1975) mentions 'Salience and avodence' as a characteristics of early phonological development. In our study too, we find that children in all the age groups were producing or acquiring the sounds that were more familiar to them and avoided the sounds that were not familiar to them. For example, children had acquired all the vowels except the vowel /ɔ / which is perceived as an allophonic variant of the vowel /o/ by the children of the target group. Also the sounds such as the voiced aspirates, which are not Punjabi phonemes, had very poor response by the children of the target group and are yet to be acquired fully as distinct phonemes as any monolingual Hindi speaking child would acquire. On the other hand the acquisition of the tonal phoneme / ◡ / which corresponds systematically to / — / level tone with voiced aspirates in Hindi, is also not acquired fully by these bilingual children. At age of three years or three years and six months when schooling begins the child acquires these voiced aspirates much faster.

This study also supports the study by Pye, Ingram and List (1987) that the children acquire sounds that are

more frequently heard. The sounds like /ɔ / and voiced aspirates have more correct response after the age of 3 years or 3 years and 6 months, i.e. after the child is exposed to the school environment. In the school these children interact with other children with different linguistic backgrounds and hence, they start acquiring those sounds which they were not very familiar with in their home environment.

After analysis of the data, the result is summarised in chart no. 43 on page (188). The chart indicates the development of sounds in Hindi-Punjabi bilingual children between the age of 1 year and 9 months to 4 years and 4 months. Chart No. 44 sums up the acquisition pattern for all the sounds. The lines labelled from A to M represent the following:

A represents: /ə/ /a/ /I/ /ʊ/ /e/ /o/ /p/ /t/ /v/ /m/

A represents those ten sounds which were acquired before the age of 1 year and 9 months.

B represents: /i/ /u/ /Æ/ /b/ /d/ /l/ /n/ /s/ /j/ /y/

B represents those ten sounds which were acquired by children by the second age-group, i.e. 2 years to 2 years and 3 months.

C represents: /ṭ/ /g/ /c/ /h/

C represents those four sounds which are acquired by children by the third age-group, i.e. 2 years and 3 months to 2 years and 6 months.

Each of these sounds reach 100% in different age-groups. This is because of individual differences or lexical items chosen as test words. Though the sounds /g/ /c/ /ṭ/ are acquired by the age of 2 years and 3 months to 2 years and 6 months, the percentage of correct response do not reach 100% earlier. This is because of individual variations or choice of the test-words. For sound /h/ the percentage of correct response reaches 100% in group 3 as /h/ in the final position is uncommon even in the adult speech, leading to incorrect responses in the other age groups.

D represents: /ṛ/

D represents the sound /ṛ/ which is acquired by children by the tenth age-group i.e. 4 years to 4 years and 4 months.

The acquisition of /r/ begins from the age of 2 years to 2 years and 3 months onwards and reaches 100% in the age-group 4 years and 4 months.

E represents: /ṛ/

/ṛ/ is yet to be acquired by the children of target group.

This is due to the fact that /r/-/ṛ/ distinction is not clearly established in some children of the target group. More data is required from the children from 3 years to above 4 years of age, so as to study the different stages of acquisition of /r/.

F represents: /ḍh/ /k/

F represents those sounds which have correct response of around 90% by the age of 4 years and 4 months.

The pattern is still emerging and it needs to be further investigated with data procured from children around three years to above 4 years of age.

G represents: /ch/ /ṭh/ /ḍ/ /ṭh/ /kh/

G represents those sounds which have high percentage of correct responses in age-group 10 (i.e. 4 years to 4 years and 4 months). The variation in correct response is attributed to different individual and lexical variances. The percentage of correct response for the sound /ch/ does not reach 100% because /ch/ is perceived as an allophonic variant of /s̆/ by some of these Punjabi bilingual children.

The percentage of correct response for /th/ and /kh/ is nearly 70% and above in the tenth age-group (i.e. 4 years and 4 months). These sounds need further investigation with data procured from school going children may be from 3 to five years of age-group.

H represents: /ɔ /

H indicates the sound /ɔ / which has the correct response 50% by the age of 4 years and 4 months. This is because /ɔ / is perceived as an allophonic variant of the vowel /o/ by the target group. It needs to be further investigations, by procuring data from school going children, may be the age-group from 3 years to 6 years.

I represents: /jh/ /š̆/

I represents sounds /jh/ and /š̆/. These sounds had around 40% correct response by the age of 4 years and 4 months.

Though the acquisition for /jh/ begins by the age of 3 years or 3 years and 6 months is yet to be acquired by the target group. For /s/ low percentage of correct response is because /š̆/ is perceived as an allophonic variant of /ch/. Since /s/-/š̆/ distinction is not yet established in the target group children have difficulty in the /s/– /š̆/ – /ch/ distinction. These sounds needs to be further investigated with data procured from children above the age of 4 years.

J represents: /dh/ /gh/

J represents sounds /dh/ /gh/. Although the process of acquisition for /dh/ and /gh/ begins by the age of 3 years and 3 months i.e. after the schooling begins, they are acquired generally after the age of 4 years and 4 months. These sounds need to be further investigated with data procured from children above the age of 4 years of age.

K represents: /ph/

K represents /ph/.The correct response for this sound is 17% by the age of 4 years and 4 months.

The percentage of correct response is very low as children do not acquire /ph/ because of /ph~ f/ variation even in the adult speech. It needs to be further investigated by taking larger data base from school going children of may be 3 years to above 4 years of age.

L represents: /bh/

L represents /bh/. The correct response for this sounds is 17% by the age of 4 years and 4 months. Though acquisition for /bh/ begins by the age 3 years or 3 years and 6 months i.e. when the schooling begins for these children, it is not acquired by the target group and needs to be further investigated, by taking larger data base from school going children of may be 3 years to above 4 years of age

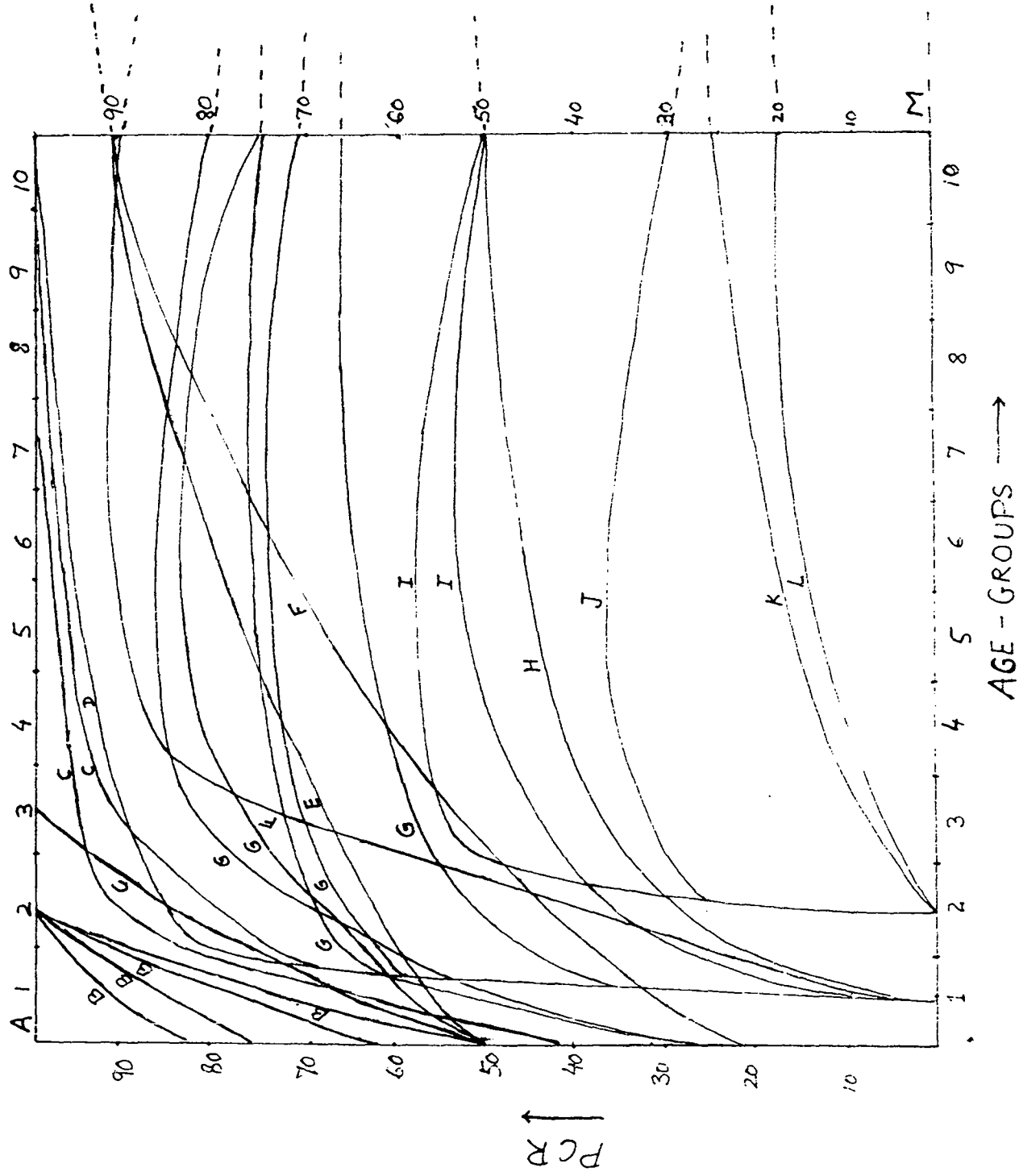
M represents: /rh/

M represents the sound /rh/. This sound was not found in this speech of the children. This is because, it is not common in the adult speech in either Hindi or in Punjabi in Delhi. It might be acquired by the children during their schooling. It needs to be investigated with data procured from children of age above 4 years.

In view of the foregoing we can club together certain sounds as given in the chart No. 44 (the bands represent the sound acquired almost together)

The sounds represented by the bands A & B, can be studies in detail by taking data from children much younger than our lowest age-group. For the study of sounds represented by the bands C & D, the ideal age-group is 2 years to 4 years and 6 months. The other bands (E onwards) represent those sounds which are not acquired fully by the bilingual children even at the age of 4 years to 4 years and 4 months. Therefore, a detailed study of the development of these phonemic contrasts in bilingual children need much more data and will be required from children from 3 years to may be 5 or 5 years 6 months or 6 years.

CHART : 43


90
80
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M
A
1
2
3
4
5
6
7
8
9
10
AGE-GROUPS →
PCR
90
80
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60
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40
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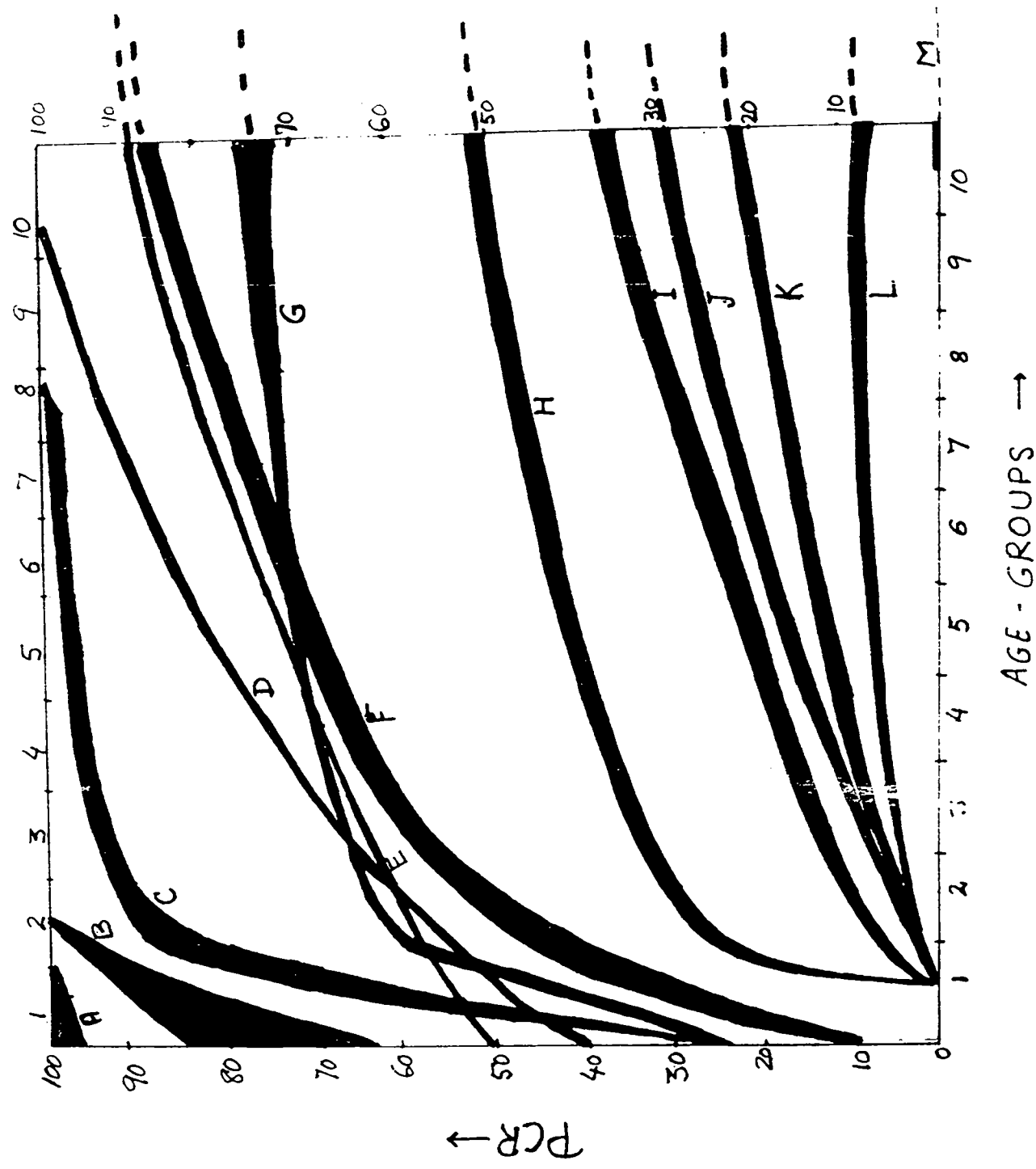
20
10

CHART : 44



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