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**THE EARLY SPEECH AND LANGUAGE DEVELOPMENT IN HINDI-
PUNJABI BILINGUAL CHILDREN IN DELHI – A CROSS-
SECTIONAL STUDY IN PAEDOLINGUISTICS**

*Dissertation submitted to Jawaharlal Nehru University
in partial fulfilment of the requirements for the
award of the Degree of*

MASTER OF PHILOSOPHY

By
SHASHWATI SOUMYA



**Centre of Linguistics & English
School of Language, Literature & Culture Studies
Jawaharlal Nehru University
New Delhi-110 067
INDIA**

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School of Language, Literature & Culture Studies
जवाहरलाल नेहरू विश्वविद्यालय
Jawaharlal Nehru University
New Delhi-110067, India

CERTIFICATE

This is to certify that the dissertation entitled “**THE EARLY SPEECH AND LANGUAGE DEVELOPMENT IN HINDI-PUNJABI BILINGUAL CHILDREN IN DELHI – A CROSS-SECTIONAL STUDY IN PAEDOLINGUISTICS**”, submitted by **Shashwati Soumya**, in partial fulfillment of the requirements of the award of the degree of **MASTER OF PHILOSOPHY** of the University, is to the best of my knowledge an original work and may be placed before the examiners for evaluation.

Prof. Vaishna Narang
(Supervisor)

Prof. Vaishna Narang
(Chairperson)

Professor Vaishna Narang
Chairperson
Centre of Linguistics & English
School of Language, Literature
& Culture Studies,
Jawaharlal Nehru University
New Delhi-110067

DECLARATION BY THE CANDIDATE

This dissertation entitled “**THE EARLY SPEECH AND LANGUAGE DEVELOPMENT IN HINDI-PUNJABI BILINGUAL CHILDREN IN DELHI – A CROSS-SECTIONAL STUDY IN PAEDOLINGUISTICS**”, submitted by me 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 University.

Soumya .

SHASHWATI SOUMYA

Centre of Linguistics & English
School of Language, Literature & Culture Studies
Jawaharlal Nehru University
New Delhi-110067

To
Maa and Bapa

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List of Abbreviations

CLR	–	Child Language Research
G	–	Group
L1	–	First Language
L2	–	Second Language
LAD	–	Language Acquisition Device
MOA	–	Manner of Articulation
MT	–	Mother Tongue
POA	–	Place of Articulation
UG	–	Universal Grammar
Vd	–	Voiced
VI	–	Voiceless
WF	–	Word Final
WI	–	Word Initial
WM	–	Word Medial

SYMBOLS AND NOTATIONS USED

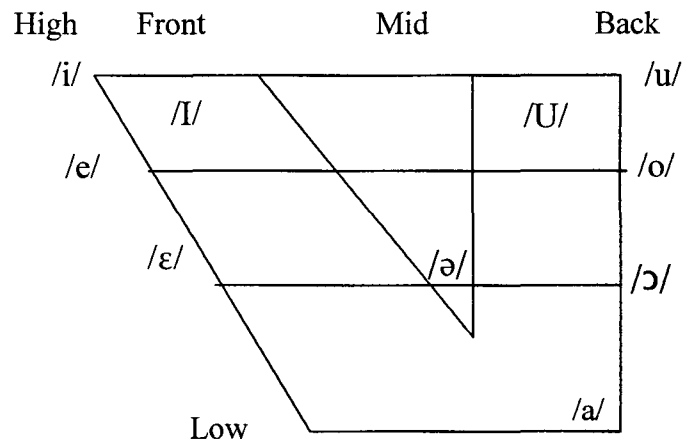
Consonant phonemes of Punjabi :

		Bilabial	Labio-Dental	Dental/Alveolar	Retroflex	Palatal	Velar	Uvular
Stop	vl vd	p p b h		t th d	T Th D		k kh g	
Affricates	vl vd	s z	(f) (v)			ʃ		h
Nasals	vl vd		m	n	N			
Laterals				l	[L]			
Trills				r				
Flaps					R			
Approximants	[w]					[y]		

[L] found in dialectal varieties of Punjabi.

(Gill and Gleason: 1972)

Vowel Phonemes of Punjabi :



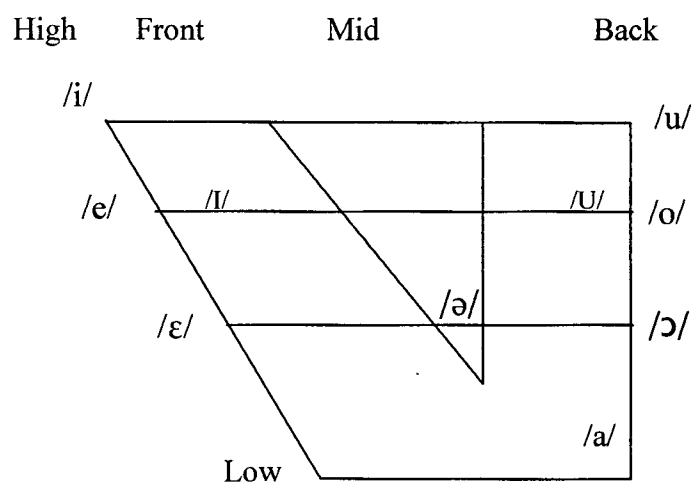
(Gill and Gleason:1972)

Consonant Phonemes of Hindi :

P.O.A		Bilabial	Labio-Dental	Dental Alveolar	Retroflex	Palatal	Velar	Uvular
Stops	vl vd	p ph b bh		t th d dh	T Th D Dh		k kh g gh	
Affricates	vl vd					c ch j jh		
Fricatives	vl vd		(f) v	s z		š		h
Nasals	vl vd		m	n	N		ŋ	
Laterals				l	[L]			
Trills				r				
Flaps					R Rh			
Approximants	w					y		

(Narang: 1984, i)

Vowel Phonemes of Hindi:



(Narang 1984: i)

INTRODUCTION

1.1 Introduction

In the breathing world, human being is the sole possessor of the power called **Language**. He is the only creature who can express himself as well as communicate with other fellow humans through ordered and meaningful utterances that he acquires through a fairly ordered set of steps and principles. This binding set of steps and principles combines possible speech sounds to form words and combine words to form sentences, thus making language an amalgamation of discrete units at various levels. The secret behind humans being the only 'speaking being' is the language learning capacity possessed in his brain. Otherwise known as the language faculty, is the capacity to acquire language is innate and species specific. From the linguistic perspective, thus the key to the understanding of language is to unravel the innate system that allows humans to acquire language. Linguists thus have been concerned with the questions pertaining to the structure of the language faculty and the process of language acquisition.

Among other issues, there is also the question of evolution –'how did language evolve in the human species'. The mode of life of humans is radically unlike that of any other animal species. Related to this topic is the issue of cultural evolution. Human life differs from other animal life in the comparative importance of cultural evolution as opposed to biological evolution. Cultural evolution occurs because of information transmitted from person to person and generation-to-generation. In this context, what seems interesting in comparing man with a chimp or any other animal, is the relevant properties of language that make possible the differences between the human and non-human modes of life. Noam Chomsky in '*Language and Mind*' (1968) writes: "It is quite natural to expect that a concern for language will remain central to the study of human nature, as it has been in the past. Anyone concerned with the study of human nature and human capacities must somehow come to grip with the fact that all normal humans acquire language, whereas acquisition of even the barest rudiments is quite beyond the capacities of an 'otherwise intelligent ape' ".

(p.52). Earlier, in 1964 Eric Lenneberg in "*New Directions in the Study of Language*" states – "There has been no evidence that any non-human form has the capacity to acquire even the most primitive stages of language development" (p.67). So, it is the possession of the power called language that differentiates the human race from the rest of the living world.

The essential properties of language in Chomsky's views are bifocal – first, the fact that human language by means of constructional processes determines a set of sound - meaning correspondence which has a finite range and secondly, the presumed necessity of a distinction between the surface structure and deep structure which determines its semantic interpretation. If these two properties according to Chomsky (*Language and Mind*), are the barest rudiments of the properties, then even these rudiments are "quite beyond the capacities of an otherwise intelligent ape." (Chomsky, 1968: 59).

Since **Psycholinguistics** emerged as a distinct discipline, the questions regarding language that have been a matter of interest and experiment. are – why language is important, what are its functions, how is language spoken, how does it occur in a human being, when does it begin to show in a human child, how does a human child acquire the first language/s and subsequent languages in the later part of the life as well. All these questions are being explored from different angles and perspectives through research in **Paedolinguistics**, otherwise known as **Child Language Research (CLR)**, is a distinct component of Psycholinguistics. Stern (1924) introduced this existing area of research, which emphasized the importance of empirical research in early child language acquisition and language learning in pre-school children. He described this field as an interdisciplinary field of research that encompasses both Linguistics and Psychology. His book '*Psychologie der Fruner Kindhei*' (Psychology of Early Childhood) explains the dual and relative contributions of Psychology and Linguistics to CLR. The oldest roots of Paedolinguistics are in child psychology, itself originating in Biology in the late 19th century. As Brown states: "It was only in the late 50s that the hybrid discipline of Psycholinguistics emerged and from

the beginning it entailed the appropriation by psycholinguists of Linguistics” (Brown, 1970: vii-viii).

1.2 Significance of CLR:

To understand the significance of Child Language Studies, we provide a brief overview of the theoretical and empirical research done in this area.

The theoretical domain can be ventured through the studies and hypotheses presented by different scholars at different points of time regarding the origin and development of language in the human child. Behaviourism in Psychology and Structuralism in Linguistics together shaped the psycholinguistic scenario in the early fifties. Noam Chomsky's cognitive and mentalistic theory of language learning along with Lenneberg's notion of biological foundations of language learning took over from the sixties.

The Structuralist Behaviouristic Approach B.F. Skinner (1957) in his book *Verbal Behaviour* puts forth the idea that no mental phenomenon is involved in language acquisition, rather it is merely the result of the sequence of habit formation, imitation, reinforcement and repetition that rule the production of language in human being.

In the late fifties Skinner's approach faced a strong criticism when Chomsky in *A Review on B.F. Skinner's Verbal Behaviour* (1959) argued that the simplistic stimulus–response–reinforcement–repetition sequence is not enough to explain language acquisition/learning, rather it involves a more complex brain phenomenon.

Chomsky's Arguments on the Cognitive and Mentalistic Theory of Language Learning: As opposed to Skinner's argument that all language mechanism is behavioural, Chomsky's cognitive and mentalistic theory of language learning holds that language learning involves complex brain mechanisms that create a complex system of rules enabling humans to create and understand an infinite number of grammatical sentences from a limited set of data

input. A child is exposed to a set of people's 'performances' that enables him to form his 'competence'. Chomsky also put forth the concepts of Surface Structure and Deep Structure and later on supplemented it with his "Creative - Construction Hypothesis" which explains that the child's language is not just shaped by external forces. The child creatively constructs it as he interacts with those around him. His logics and arguments led to a shift in interest from the externals to the innate language learning capacity, the LAD (Language Acquisition Device) with which the human being is born. This capacity gives the child a means to process the speech in the environment so that he can construct its underlying system (UG i.e. Universal Grammar).

Lenneberg's Biological Basis of Language Learning: E.H. Lenneberg in his *Biological Foundations of Language* (1967) proposes the 'Critical Period Hypothesis' (CPH), which explains that young children acquire the syntax of a language effortlessly, with easy rapidity while adults, can't; this difference between children and adults suggests that there is a critical period for language learning. Under normal natural conditions, before the age of 12, any child is capable of acquiring language/s with all ease.

Lenneberg's studies brought a turning point in Linguistics. In his book, he talked about the biological nature of language and for the first time proposed that language could have a biological base. The propositions he put forth for the biological nature of language were – language emerges automatically, like any other biological activity; it has also its path of growth and development and there must be certain developmental milestones in the stages of language growth. Apart from this he introduced the term 'Cognitive Function' and based on this he put forth his five general premises explaining the biological basis of language which were published in "*Towards a Biological Theory of Language Development*" (1967). He defined cognitive function as a genetically devised cerebral function that tends to mediate between sensory input and motor output. The five general premises showed that the cognitive function that Lenneberg talked about is

species specific, specific properties of cognitive functions are replicated in every member of the species, cognitive processes and capacities are differentiated spontaneously with maturation, at birth man is relatively immature—certain aspects of his behaviour and cognitive function emerge only during infancy and certain sound phenomena among animals come about by spontaneous adaptation of the behaviour of the growing individual to the behaviour of the other individuals around him. “In his book Lenneberg also anticipated many themes of the coming decades—genetics of language acquisition, genetics of language disorders (dyslexia, specific language disabilities), language of the deaf children, ‘wolf children’, critical period, twin studies, family pedigrees, aphasia and language, language evolution etc”. (Jenkins 2000:3)

Lenneberg's propositions were published and after that there was no looking back. The entire arena of linguistics got a new look. The field of Linguistics was seen from a new perspective – that was the biological perspective. This new look of Linguistics came to be known as Biolinguistics and prospered in the hands of Chomsky and S.E. Luria in the early seventies. In 1974, in a meeting on Language and Biology, Chomsky and S.E. Luria, for the first time recommended it as a distinct subject of enquiry. The five general questions that were of Chomsky's primary concern in the issue of brain-language relationship were—

- *What constitutes knowledge of language?*
- *How is this knowledge acquired?*
- *How is this knowledge put to use?*
- *How did this knowledge evolve (in the species)?*

(Chomsky (1991a) – “*Linguistics and Adjacent fields – a personal view*” as reported in Jenkins, 2000:1).

These have been the most sought after questions in Biolinguistics till date. The history of Linguistics for the first time witnessed in Biolinguistics, an

amalgamation of Linguistics, Biology, Neurophysiology, Ethology, Psychology, Philosophy, Social Psychology, Biophysics and Biomathematics.

Biolinguistics is highly entwined with Chomsky's notion of generative grammar. Jenkins in *Biolinguistics* explains: "Although the basic ideas of Biolinguistics found a great deal of resistance in the academic fields of Linguistics, Philosophy and some areas of cognitive sciences, by the early 70s, the result concerning the biological nature of generative grammar had been easily assimilated and well received by many scientists and molecular biologists, who offered a number of speculations on biology and language with specific reference to generative grammar". (2000:4)

Adding to this, to quote Jacob "According to modern linguistics, there is a basic grammar common to all languages; the uniformity would reflect a framework imposed by heredity on the organization of the brain.. Many traits of human nature must be inserted in the framework established by the twenty-three pairs of chromosomes, that to make up the common inheritance of man" (1976: 322, as reported in Jenkins. 2000:4).

Luria, in his discussion on Modern Linguistic Analysis wrote: "To the biologist, it makes eminent sense to think that, as for language structures, so also for logical structures there exist on the brain network some patterns of connections that are genetically determined and have been selected by evolution as effective instruments for dealing with the events of life" (1973: 141) (reported in Jenkins 2000, p.4).

Such ideas discussed by scholars strengthen the view on brain-language relationship.

As the whole issue of Biolinguistics concerns the fundamental quest of language, its development and evolution, it is considered an integral part in the studies of child language acquisition and it is needless to say that new findings in

Biolinguistics have always thrown light on Child Language Research along with opening new vistas in the study of child language development.

In child language studies three different hypothesis are put forward to establish a link between language input and language acquisition in human infant.

- ***The Strong Continuity View*** – It assumes that the principles of UG (Universal Grammar) are available to the child at the onset (the first day of language learning). This principle of universal grammar guarantees that the child's grammar falls within the borders of a natural language.
- ***The Weak Continuity View*** – The child's system may represent a subset of the adult systems or underspecified with respect to the adult system. This view has been a collective proposition by Lebeawe (1788), Radford (1790), Foyle and Noonan (1992) and Clashen (1999).
- ***The Discontinuity View*** – The proponent of this view was David Bickerton. In his book *Language and Species* Bickerton proposed this view with the assumption that the child's language system is radically different from that of the adult system. The Proto Language is completely different from language because there are no proper linguistic characteristics in the initial system of the child.

Paula Menyuk criticized the discontinuity view as she sees infant vocalization as a continuous process right from the first day up to adulthood. She remarks that no utterance in infant vocalization is non-linguistic.

The Empirical Studies in CLR dates back to the later half of the 19th century using data recorded in personal parental diaries. As the scenario changed, it moved on to more sophisticated and serious processes and the investigation became more detailed and systematic in the middle of the 20th century with the invention of tape recorder. It helped the analyst keeping a permanent record of sample of child utterances that would ultimately make the analysis and description errorless. After the 60s, varieties of new and more sophisticated

observational and experimental techniques were devised. Children were observed and recorded through one-way vision windows, radio microphones etc. to eliminate the chances of disturbances and interference in data elicitation. New researches came up with developed acoustic techniques that were helpful in analyzing pre-linguistic infants' vocalization and their level of perception. All of the new approaches increased the level of accuracy in data collection, thereby resulting in a more reliable and authentic set of data on the stages of language acquisition.

A detailed account of the developments in Child Language Researches practice have been given in Chapter II while discussing the historical background and literature review.

As CLR studies primarily focused on putting forth an elaborate and factual description on the stages of language development, it would be appropriate to provide a brief overview on the distinct developmental stages of language development in a child.

Though we can recognize a fairly stable sequence of developmental stages in the child's acquisition of phonology, grammar and word meaning of the language, it may not make sense to think of a child as passing suddenly from one stage to the other. There is a further complication that a child's production may not match his comprehension. In fact, it is generally agreed that comprehension always precedes production in the developmental sequence. It follows that a child's spontaneous utterances may not directly reflect his knowledge of the language that he is acquiring.

Recent researches prove that in the matured pre-natal stage, the child responds to linguistic utterances. Further, babies in the first few days of post-natal life are responsive, not only to the human voices but also to the differences between corresponding voiced and voiceless consonants.

The Stages

Stage I: *Reflexive Crying* – (1-8 weeks): The first stage of infant vocalization is of reflexive crying which lasts from 1-8 weeks in the post birth period. It has been proposed that infant cries contain a set of differentiated messages. Lind (1965) has edited a number of studies of the crying sound of the newborn infant and Wolff (1969) has demonstrated that these different cries communicate different messages. The communicative aspects of normal child of 8-12 month and autistic child of 3-5 years of age have been studied by Derek Ricks (1972). Under controlled conditions children of this age convey four types of messages – a requesting sound, a frustrated sound, a greeting sound and a sound expressing pleased surprise.

Stage II: *Cooing 8-20 weeks* – Cooing follows the reflexive crying, which is often referred to as the pre-babbling period. It is suggested that this stage of language development is innately determined since the sounds that are produced in crying and cooing are unaffected by the linguistic environment in which the child is being brought up. If we go by the continuity view there is no distinction between linguistic and pre-linguistic period.

Stage III: *Vocal Play/Babbling: 30 weeks to 10 months* – Many speech sounds may or may not be employed in a language found in the child's environment. The later stages of babbling period induct some of the intonation patterns of their native language. Though there is no evidence however, that the utterances with intonation patterns have a distinctive communicative function.

In certain cases babbling overlaps for a considerable time with the process of acquiring and making use of phonological distinctions and the difference between babbling and talking then becomes quite apparent.

Stage IV: *The one-word stage/holophrastic period: 10-18 months* – Segmental distinctions are found in this stage. Child produces one-word utterances without any clusters and more of reduplicative words. “By the time the child reaches the stage of 18 months or so, he is already in the possession of

the ability to distinguish between 'things' and 'properties' in the 'situations' in which he is learning and using language. And this ability seems to me quite adequate as a basis for the learning of the principal deep structure relationship between lexical items (the subject- predicate relationship), provided that the child is presented with a sufficient amount of 'primary linguistic data' in real situations of language use". (Lyons, 1966:131).

Stage V: *The two-word / multi-word stage* – Between one word and multi-word stage there is a two-word stage where child begins to express a variety of grammatical relations. The basic form of subject-predicate structure becomes obvious. Negative utterances mark their start in this period. Craig Lawson's findings reveal that even at the age of two the child has already developed increasing knowledge of the conventions of varying speech according to social situations and peer group.

Stage VI: *The multi-word stage/Telegraphic speech* – The whole span of two-word stage to the multi-word stage to the basic sentences stand spread from 27 months to 5 years.

The early part of this stage witnesses the emergence of auxiliary verbs, yes/no questions, with a limited number of 'wh-' questions.

The later part of the stage is associated with telegraphic speech – sentences that lack inflections and function words.

Roger Brown's (1973) experiment shows that the order of frequency of grasping the function words and the inflections don't correlate with the order of acquisition. So, it can't be explained through simple habit formation hypotheses. This is further evidence that the child is an active contributor to the acquisition process.

In the later part, the child masters transformation in negation and interrogation.

Stage VI: *The Later Development* – The complex sentence structure, the subtle grammatical distinctions come to the child gradually by the age of 10.

A monolingual ~ a bilingual Child

Depending on the language surroundings, if a child gets exposure to a single language, he becomes a monolingual and when the exposure is to two or more languages simultaneously or in the later periods of life, he becomes a bilingual or a multilingual. Can we distinguish the acquisition pattern of a monolingual child and a bilingual child? Neuropsychological studies show no comparative differences in the language acquisition and speech production between the monolinguals and bilinguals. For example, studies done by Barton, Goodglass and Skai (1965) found no differences of lateralization between Hebrew - English bilinguals and English monolinguals. These studies showed the Left Hemispheric advantage in both the groups. However, later discoveries by Walters and Zatorre (1978), F.W. Carrol (1978a), Vaid and Lambert (1979), Galloway (1980) and Sussman, Franklin and Simon (1982) show a greater Right Hemispheric (RH) involvement in bilinguals. “However, this controversy of LH and RH dominance is in terms of population characteristics such as age of onset of bilinguality and L₂ proficiency. This suggests that a number of factors which are likely to influence the cerebral organization of a bilingual have to be taken into account.” (Hamers and Blanc, 1983: 42)

Keeping aside the neuropsychological controversy, it is very interesting to note - “Most of the research on child language acquisition has been concerned with monolinguals rather than bilinguals, despite the predominance of bilingualism in the world’s population”. (Romaine, 1989:181). Most of the monolingual studies have been done in English monolinguals – “Fantini (1985: 10) has pointed out that in Slobin’s (1972) updated publication of Leopold’s (1952) Bibliography of child language, only 3 out of 50 studies mentioned were full longitudinal case studies of bilingual children”. (As reported by Suzanne Romaine in *Bilingualism*, 1989: 181).

The scenario changed and the interest shifted from monolinguals to bilingualism. Today bilingual researches outnumber monolingual studies. If we take a comparative study of the monolingual and the bilingual child, it shows that the pressure of acquiring more than one language is certainly more than the pressure that is built when a single language is acquired. Before moving further in bilingual acquisition studies, it is mandatory to mention here that the L₂ mentioned here in the present study is not the L₂ learnt by the adults, this is the second L₁ learnt simultaneously by the child in a bilingual set up. The monolingual and bilingual acquisition of language can broadly be divided into 3 categories.

1. ***The L₁ acquisition:*** This is unique to the monolingual child in a one language set up acquiring a single language, most of the times his MT or L₁.
2. ***L₁ acquisition + L₂ added in different domains:*** C. Kessler (1984) terms it the situation of 'sequential bilingualism'. The child starts with one language (L₁) and subsequently L₂ is learnt depending on the different domains, age and reasons of learning the language.
3. ***L₁ + L₂ as L₁ acquisition:*** The age and reason of learning being the same, in the same domain of language use, the child acquires two languages L₁ which is a situation in 'simultaneous bilingualism' (Kessler: 1984).

The present study investigates a case in simultaneous bilingualism where the bilingual child acquires two languages from the beginning. Swain's studies (1972) focus on the acquisition of bilingualism as a first language and Meisel (1990) supports it with the supporting idea of two first languages. The present study, as discussed earlier, is a study in simultaneous bilingualism. It puts forth a set of research issues such as:

- To what extent does the bilingual differentiate between his two languages.
- To what extent do both the languages influence and interfere with each other especially at the phonological level.

Child language acquisition studies are not limited to normal children. The discussion would remain incomplete if it doesn't include the role of acquisition studies in studying language development in delayed learner that is of much relevance in the field of Clinical Linguistics.

1.3 Normal Vs Delayed/Deviant Child Language Development: The Domain of Speech Pathology:

An in depth study in Child Language Acquisition aims at putting forth a wholistic account of language acquisition in normal learners as well as slow learners. Studying delayed and deviant patterns in language development is as important as studying normal child language behaviour. Child Language Studies conduct researches to understand different language deviations and disorders among children regarding speech and language so as to help them through speech therapies, which aim at taking care of the deviations. The area of speech pathology deals with speech/language disorders in children and therapeutic measures for the same.

Among other researchers, David Crystal's study on language pathology is worth mentioning. In his book "*Introduction to Speech Pathology*" (1980) crystal summarizes that any abnormality in communication system caused by the malfunctioning of any of the five senses i.e. vocal/auditory, visual, tactile, olfactory and gustatory, leads to language disorder and are treated as pathological cases. Moreover, it has always been disability in speech, the primary index of language ability, which has attracted attentions for years. The term 'pathology' has been extended to the study of not just a disease, but of any "abnormal, mental and moral conditions" (The Oxford English Dictionary). The recent development in the realization of the term is its sense of deviation from any assumed normal state.

Cases in speech pathology are handled through four procedures and models

i. Assessment procedures and models

- ii. *Evaluation procedures*
 - iii. *Diagnostic and prognostic procedures*
 - iv. *Therapeutic procedures*
- i. **Assessment Procedures and Models:** It is the first step taken for the detection of language disability in the child. Assessment procedure is the profile to detect the child's strength and weakness in terms of speech comprehension and hearing. David Crystal describes two basic models, which explain the assessment procedure. The medical model and the behavioral model

Medical model derives from the principle and practices of medical science along with its contributing disciplines like neurology and anatomy. It tries to classify and explain linguistic abnormality in the same way as it deals with any other bodily abnormalities. In the medical model the assessment procedure begins with providing information about the area of the brain that has been damaged and the effects of the damage on the overall growth of the child.

On the other hand, the 'behavioural model' derives from behavioural sciences like Sociology, Anthropology, Linguistics and Psychology. Its assessment procedure differs from the pattern followed in the medical model. It begins with a description of the characteristics of the child's speech/language (verbal behaviour). The aim would be to see if there was any stability of pattern in the speech or whether he had preferences for the use of one area of language rather than another.

The two models act complementary to each other, the first focusing on the child's general condition, as a context for understanding his limitations in behavioral patterns and the second focusing on the patient's behaviour. All the procedures in speech pathology rely on the two models one complementing the other, rather than one in lieu of the other.

The assessment procedure takes both the models equally into account while identifying the speech disabilities.

- ii. **Evaluation Procedure:** The child's speech condition gets focused in the assessment procedure; the second procedure is the evaluation procedure, which evaluates and calculates the extent to which the child shows disability. This procedure as the name suggests depends heavily on normal patterns of language development so that the disorders could be described with reference to that.
- iii. **Evaluation procedure is followed by the Diagnostic and Prognostic Procedures:** Taken together the signs and symptoms of the disability, the speech pathologist gains the required information to be judgmental about the nature of the disease either immediately or after subsequent investigations such as blood tests. The child undergoes a thorough checkup to arrive at a proper judgment of the disorder. The process is called 'diagnosis' compares one set of signs and symptoms with another, enabling the pathologist to select a hypothesis that would explain more satisfactorily the present condition of the patient. This is otherwise specified as 'differential diagnostic procedure'.

The moment the child's nature of language disability is diagnosed, the speech pathologist moves on to the prognostic procedure where he makes a prediction (or prognosis) about the patient's future medical condition and to decide the level of improvement that can be expected from the child. In very broad terms some of the predictions about the kind and rate of linguistic recovery are made which would further lead to the recommendation of therapeutic procedure.

- iv. **Therapeutic Procedures:** Once the child is marked linguistically challenged, he is recommended certain therapies like the articulation therapy or speech and language therapy. The kind of therapy that the child would undergo is decided by the kind and stage of speech and language intervention the child requires.

1.4 Aims and Objectives of the Present Study

As introduced earlier, the present study was designed to examine closely the normal speech and language development in bilingual children in Indian

multilingual context. Language in the environment acts as the input to the child's inbuilt language mechanism, which deduces the rules from the limited input. The case study had been done on **Hindi-Punjabi bilingual children** settled in Delhi. The children belong to families with simultaneous bilingualism ($L_1 + L_2$, acting as L_1). Punjabi being the MT/L_1 , Hindi acquisition also starts from the very beginning. The primary concern of the study was to see how the child learns two different languages as his L_1 . The research also aimed at identifying the influence of the similarities and differences of the two language systems that the child was exposed to. Answers to these research quests have been unveiled as we move further on to the chapters on data analysis and discussion.

Beside the fact that the present study on bilingual child concentrates on normal learners, ultimately, my aim through this preliminary study would be to utilize the research results in assessing the delayed learners, so that it would be helpful to the disabled child when professional intervention would be required during speech therapy.

*BACKGROUND STUDIES AND
LITERATURE REVIEW*

In continuation of the discussion in the first chapter, an attempt is made in this chapter to discuss in brief, the remarkable periods in the history of CLR with a focus on how these periods have been influenced and shaped by their contemporary theories of language learning.

Psychologists consider language as an important mode of behaviour and they feel that “the study of the process where by children learn to speak and understand language holds the key to many fundamental problems of behaviour”. (Carroll 1961: 331).

2.1 Chronology of CLR Studies

David Ingram (1989:7) distributes Child Language Research into 3 historical time periods:-

1. 1876 – 1926: Period of Diary Studies
2. 1926 – 1957: Period of Large Sample Studies
3. 1957 – present: Period of Longitudinal Studies

Period of Diary Studies: In the seventies of the 19th century, for the first time in linguistic history, scholars focused their interest in child language development. The earliest ventures were through ‘parental diary/diaries, the linguist (or sometimes non-linguist) parent keeping written note of the day-to-day language development of his/her child over a period of time. Many of them were published sometimes in raw forms and sometimes with selected entries and interpretation and came to be known as ‘baby biographies’. In 1976, H.Taine’s diary on his daughter’s linguistic development from birth till the second year of life was published in *Mind* and was the first ever parental diary in a published paper form (as reported Ingram 1989:8) followed by Charles Darwin who added a report on his son’s language development in the following number of *Mind*. It was just the beginning and paper publications of parental diary studies gradually became a norm in English and other foreign languages as well. Prayer (1889) in Europe, came up with the most extensive diary study done on his son Axel which provided brilliant linguistic information. 1907 witnessed the work of Clara and

Wilhelm Stern's 'Die Kindersprache' which was exclusively on the study of child language. The study was on their two children Hilde and Gunter. The translated version of this work was later on published in 1924. In North America, White Hal started a journal on 'Pedagogical Seminary' which regularly published reports on child's early language development. The journal included works of Bateman (1916), Brandenburg (1915), Chamberlein and Chamberlein (1904, 1905, 1909), Pelsma (1910), Nice (1917) and Nice (1920).

However, diary studies didn't end in 1926. Leapold's work (1939-49) on his daughter Hildegard from birth till she was two years old was one of the remarkable studies on child language published in four volumes. Among the recent works, it was Smiths' in 1973 when he studied his son A's phonological development.

Diary studies have been criticized for being biased, random and unsystematic. Gaps between dates and notations were a common feature which put hindrance in the analysis of data. Despite these drawbacks, diary studies have proved to be the pioneer studies in CLR and are of great value as they equip the researchers with extensive data base which help them in finding a pattern in the child's general language development.

Period of Large Simple Studies: The immediate years following the First World War witnessed a major shift in Child Language Studies highly influenced by the emergence of Behaviorism in Psychology. Diary studies gave way to the new period of large sample studies. Motivated by B.F. Skinner's (proponent of Behaviorism) chain of experiments from 1934 to 1955, the entire period moved on the line of Skinner's proposal of stimulus, reinforcement and association which were considered the key to language learning.

However, 'Large Sample' referred to the size of sample of children taken for the study. The method selected subjects carefully and systematically. Consistency was maintained while choosing the socio-economic background and gender of the subjects. It happened to be a cross-sectional study as it studied different children at distinct ages. Unlike diary studies, the data analysis in these studies were full of quantified results, tabulation and percentage calculations. It

studied group behaviour rather than individual behaviour. The observations done in diary studies were superficial. The large sample studies period which continued for almost 37 years, had emphasis on three major areas – vocabulary growth, sentence length and correctness of articulation. Based on these 3 areas of focus, investigations were pursued on different categories of children. Among the major studies were the studies on normal children by Smith (1926), Mc Carthy (1930) and Wellman et al (1931). Day (1932), Davis (1937) studied and compared twins and singletons. Lower social class children were studied by Young (1941).

Jakobson's study of child phonology holds special significance in CLR because of his detailed in depth analysis of the order of acquisition of phonemes also using the acoustic information for the interpretation of the data. His theory of phonological development has been explained in the form of phonological triangles which has been explained in detail in section 2.2. By the time Templin published his work in 1957, Noam Chomsky's *Syntactic Structures* (1957) based on cognitivism and mentalistic theory of language learning was taking over the linguistic scenario. Chomsky's view discarded Behaviourism and gradually gave way to the third period in child language studies, i.e. the period of longitudinal sampling.

In 1957, the period of large sample studies had virtually come to an end. However, much later once again in 1971, this method was retrieved by Olmsted in his major work on phonological development of a sample of one hundred subjects.

The major drawback in this period of study was that in spite of the new procedures followed, the large sample studies could not label the intricate system of rules that language is built up of. They also lacked in the application of proper modern methodologies for data elicitation. In fact the techniques and methods changed and evolved along these studies.

The Period of Longitudinal Sample Studies: To quote Ingram, "in longitudinal sampling, the child is visited at predetermined intervals for a reasonable length of time with the purpose of collecting a representative sample"

(1989: 22). With Chomsky's emerging theory of transformational grammar, the goal of linguistics moved from description to explanation. Chomsky's *Syntactic Structures* (1957) triggered a rule based explanation of child language development. For the second time in 1965, in his 'Aspects of the Theory of Syntax' Chomsky expressed language to be a rich and complex system which is certainly more than a mere association of linearly ordered words. Such notions influenced the period of longitudinal sampling and were counted to be most effective when it came to analysis of database. The children and their responses were no more viewed superficially or treated through mere description, rather it was a more in depth study towards the complex level of linguistic analysis.

Some of the remarkable studies using longitudinal language sample since the 60s have been by Braine (1963), Miller and Ervin (1964), Bloom (1970) and Brown (1973). The studies done by them were very systematically sampled which provided highly informative database.

Longitudinal and Cross-Sectional Sample Studies: After the mid 70s, researchers started a new kind of sample study by combining longitudinal and cross sectional samples. Study that follow the progress of a set of variables over a time in the same set of children is called longitudinal sampling. However, language emergence can also be studied using a set of variables in a group of children of different ages using different subjects at each age. Such studies are called cross-sectional studies. Combined designs of longitudinal and cross-sectional researches are also being held in CLS. The present study is a case in cross-sectional sampling. Children taken as subject for the study range in the age group of 3 to 5. I consider it a research at a very preliminary level but the significance of this study lies in the fact that they are all bilingual children, all born and brought up in a bi-/multilingual environment. Most of the previous studies reported in literature, as discussed above are on monolingual children brought up in their respective native language environments. I would like to pursue an elaborate longitudinal study in my Ph.D. programme on some of the subjects I have taken now and study the acquisition process in much more details.

2.2 Phonological Triangles of Jakobson:

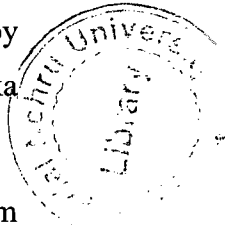
The year 1941 witnessed a turning point in child language acquisition studies with the publication of Roman Jakobson's highly significant work *Kinderpache, Aphasic and All Gemeine. Lantgesteze* (translated by Keiler in 1968). Jakobson states that "relative chronological order of phonological acquisition remains everywhere and at all the time the same", and while the phonological acquisition in child appears to be stable in its fundamental characteristics, the speed of succession in contrast depends on the individual is exceedingly variable". (Jakobson (1941) as translated by Keiler 1968) (As quoted by Tulika Chandra unpublished M.Phil. Dissertation, JNU 1994:4).

Jakobson further proposed that "the child learns to make various distinctive features in a developmental sequence, the consonant – vowel distinction being learnt first. Rarely used distinctive features are learnt latest by the child. (As reported by Carroll in S. Saporta (ed.) 1960) (As quoted by Tulika Chandra 1994: 4).

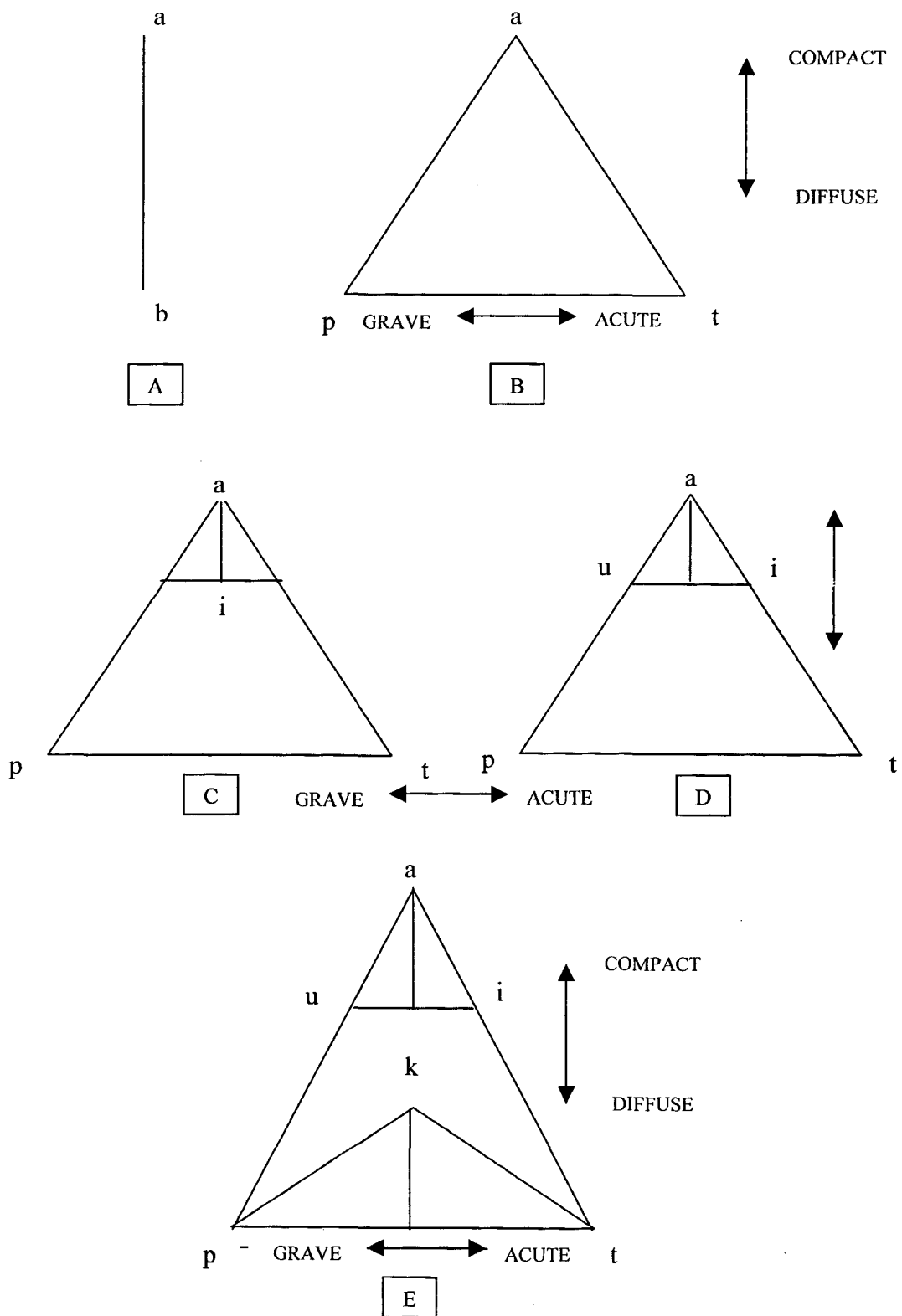
Jakobson illustrates his hypothesis based on the principle of maximum contrast in the form of phonological triangles. The triangles as explained by Holenstein in 1976 are as follows:

D|SS

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(Jakobson's vowel and consonant triangles (1941) as explained by Holenstein 1976)

Explanation for the Phonological triangles: These phonological triangles explain that vowels and consonants are joined in a unified system. The fundamental split can be seen along the compact-diffuse axis. As his theory of 'Phonological development' says that the development of a phonetic system is the result of filling up the gaps between two extreme sounds /p/ and /a/, the split along the compact diffuse axis thus 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 concentrated and high energy /a/ contrasts with low energy stop /p/ and /t/. both stops are opposed to each other by a predominance of one or the other of the frequency spectrum as the 'gravity' and 'acuteness' poles. The primary triangle then splits into two i.e. vocalic and consonantal. Vowels are the first to be internalized due to their compactness and sometimes the only split takes place along the compact diffuse axis. Since, the acute ~ grave contrast gradually prevails as compactness decreases, it forms the first and sometimes the only consonantal axis. On the other hand, the vocalic split along the consonantal axis, the acute/grave (/i/ - /u/) is secondary. Similarly the consonantal split along the vocalic axis, compact / diffuse. (/k/ - /t/) doesn't occur until after the specific split occurred into acute and grave consonants. Jakobson (1941) as explained by Holenstein 1976 Jakobson has further explained that the phonemes that are relatively rare among the languages are among the last phonemes to be acquired by the children exposed to these languages. In general, rare phonemes embody more distinction of more subtle type than do the phonemes of wider distributions.

In the later period researchers did find evidences contrary to Jakobson's model but in the field of acquisition studies Jakobson's proposals hold good till date. E. Clark in (1971) stated that Jakobson's model falls short of explanations regarding some of the 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 as a sound can occur in 3 different positions in a word – initial, medial and final. In this context Moscovitz (1970) found that "the word initial position is one in which there is maximum contrast within the young child's phonological system. In the W medial position there is much more

variability and the use of final position consonants develop much after in the developing system". (as quoted by Tulika Chandra 1994: 7)

R. Burling (1959) made a diary study of his son Stephen, brought up in India and exposed to a bilingual environment of Garo and English. Burling observed 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 consonants and devoicing of the vowels.

Jakobson's study inspired Irwin and Lewis in 1946 in their cross-sectional studies, done on a large number of infants. The findings can be summed up in the following manner.

- a. Vowels predominated in the infant's vocal output in the early months of life, both in terms of overall frequency of occurrence and the ratio of vowels to consonant types produced.
- b. Consonant showed more rapid growth than vowels in the first two years of life.
- c. The data also indicated that consonant types produced at the back of mouth were acquired first and anterior sounds were acquired later. Vowels were acquired in the reverse direction i.e. from front to back.

2.3 Child Language Studies in Mono-Bilingual Context:

Among the studies in monolingualism, the worth mentioning is Anderson and Bruce Smiths' case study on six monolingual Puerto-Rican children of age 2. The study focused on the phonetic and phonological patterning in the 2 years old. Results indicated that patterns such as the higher occurrence and greater accuracy in producing nasals, unaspirated stops and late occurrence of aspirated sounds and palatal sounds in Puerto-Rican children were found similar to those found in monolingual English learning children of the same age. It shows that certain universal patterns exist in the child's phonological development. (*Journal of Child Language* 14. 1967: 57).

In India although multilingualism dominates, G.P. Srivastava (1974) observed a Hindi monolingual child and investigated the acquisition of consonants in the child's pre language and early language stages. He makes elaborate statements that by the age of two years a Hindi speaking child acquires aspiration. He refutes McCarthy's statement by claiming that Hindi speaking children do not follow the pattern as suggested by McCarthy (1966) that the development of consonant learning starts from back of the oral cavity towards the front. (*Indian Linguistics*. vol. 35: 112-118).

In 1987 Pye, Ingram and List conducted a study primarily on Quiche speaking children and compared it to a core set of initial consonants for English, proposed by Ingram (1981). The subjects were a group of 15 children. Their observations showed that the Quiche Speaking children were acquiring a very different set of consonants as compared to their English counterparts. While there were some similarities, as of nasal and voiceless stops, there were more dissimilarities. The data showed that the children acquire sounds that are most frequently heard and that the children, by the single word stage have already started acquiring the phonological system of the language. (*Children's Language*, vol. VI:175-190).

2.4 Monolingual Vs. Bi-/Multilingual Child:

Unlike monolingual child language development, language development in bilingual situation is expected to be different as in the latter situation the child is acquiring two or more phonological systems. Studies on bilingual phonological development show 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 yrs. old children demonstrate. (As reported in the *Journal of Child Language*. vol. 14, by Smith).

Among several researches done on the language acquisition in bilingual children, Fantini's 1987 study on a bilingual child puts forth some of the issues of the child handling two different communication systems simultaneously. He points out that to determine how and when the child begins to differentiate

languages so that he eventually realizes that he is in fact learning two different communication systems, the factors that are necessarily be taken into consideration are the child's exposure to both the languages in terms of percentage of contact hours, for every month along with the knowledge of the place where the acquisition is taking place.

Putting forth his own hypothesis, he says that bilingual acquisition is potentially an interesting test of the existing idea that children come to language learning being equipped with a universal grammar which is then modified on exposure to the environment. Another question that comes up in his discussion is that even though the child is given quite separate exposure to both the languages, how do we get the clear evidence that the child indeed distinguishes the two systems at an early stage. Fantini's explained – "The more separate the environments in which each language is used, the more rapidly and the more easily he learned to differentiate the linguistic systems".(1985) Researches show that from the second half of his third year onwards, the child is increasingly able to produce the two languages separately and also to make metalinguistic comments on them.

Bilingual mixing has been another area of concern for researchers and parents as well. It is assumed that the bilingual child is usually overburdened with the simultaneous acquisition of two languages as it is noted that bilingual children mix elements of both languages and inconsistency is seen in using both languages.

The hypothesis of bilingual mixing was supported by Swain (1972) with his postulation of a 'unitary language system' interpretation which states that children learning two languages simultaneously during infancy, go through a stage when they can't differentiate their two languages. In 1977, Swain added the concept of a 'common storage model' in bilingual development that showed that in a simultaneously bilingual child all rules of both languages are initially stored in common location, may they be the common rules or the rules specific to a particular language. Subsequently through the process of differentiation they move to their appropriate position in their respective languages.

Fantini (1978), Lindholm and Padilla (1978), Volterra and Taeschner (1978) and Redinger and Park (1980) supported Swain and added to the explanation of bilingual mixing that the bilingual children mix because they lack appropriate lexical items in one language but have them in the other language and thus effectively they lack appropriate lexical items in one language but have them in the other language and thus effectively borrow from one language for use in the other.

Fred Genesee, in 1988 revisited the unitary language system hypothesis. Re-examining the hypothesis on an empirical basis, he put a contrast to it. He argued that contrary to the unitary language system hypothesis, bilingual children develop differentiated language systems from the very beginning and are able to use their developing languages in contextually sensitive ways.

As the present study concentrates on speech and language development in Hindi-Punjabi bilingual children in an Indian set up, it is important to discuss some of the recent works done in Indian bilingualism which would be beneficial for the present study. AIISH, Mysore has conducted some development studies on Kannada speaking children in bi-/multilingual set up.

In the last decade Centre of Linguistics and English of the Jawaharlal Nehru University, conducted 3 major researches in this field which are relevant in this context are as follows.

Meenakshi Gupta's M.Phil dissertation (1993) on *Acquisition of Fricatives and Affricates in Hindi* is a cross-sectional survey done on 100 children, most of them coming from Punjabi families and the rest from families with different mother tongues. The children were exposed to Hindi and English. The age bar chosen for the study was 1.6 yrs to 6 years. The children were picked from preschools and nurseries where they communicated with their friends in English and Hindi as well. The children belonged to middle class or upper middle class. A gender distinction was also made in the study to eliminate the chances of any differences in the responses within an age group due to difference in the gender.

The test sounds that were considered for the study were 6 Hindi phonemes /c/, /j/, /s/, /š/, /f/ and /v/.

The 'Chi-square analysis' was adopted for data analysis. The hypothesis Meenakshi Gupta postulated in her study has been put forth by her in the section on summary which goes as follows.

1. Acquisition of sounds is gradual and not abrupt. The child's responses vary between correct and incorrect responses before he/she masters the sound.
2. production of test sound doesn't improve with imitation i.e., the other method of elicitation.
3. Production of the test sound doesn't vary depending upon the phonological position of the test sound if all the words are phonologically equally easy or difficult and are equally familiar for the child.
4. Production pattern doesn't differ whether the test sound is produced in a word alone or the test word is produced in a sentence.
5. Certain substitutes are more common than the others. Most of the times children show a preference for the stops, as a substitute for the fricatives.
6. Usually a voiced sound substitutes a voiced fricative and a voiceless one for a voiceless fricative.
7. /c/ is usually acquired before /j/, /f/ before /v/ and /s/ before /š/.
8. In spite of the general patterns being present in terms of the order and process of acquisition of sounds, individual variations are also present which can't be ruled out. (1993: 84)

In 1994, Tulika Chandra presented her M.Phil dissertation titled *The Phonological Development in Bilingual Children: The Case of Hindi and Punjabi Bilinguals in Delhi*. She surveyed 120 children, all of them being Hindi-Punjabi bilinguals coming from Punjabi families residing in Delhi. Hindi and Punjabi were used in all domains of language use thus, the child was exposed to Hindi and Punjabi both at home and outside. She took three variables into account, age gender and social class. The study surveyed 66 males and 54 female bilinguals

ranging from the age 1y 9months to 4y 4months divided into 10 groups. Her study was focused on the phonological development of the bilinguals. She had divided subjects into two social classes – Upper Middle Class and Lower Middle Class. She summarizes her study in the following points:

1. The survey and analysis showed that the sounds that are common to both the languages (Hindi and Punjabi) were acquired earlier and the sounds which are found either in Hindi or in Punjabi only acquired later.
2. By 1y 9months /ə/, /a/, /ɪ/, /i/, /U/, /u/, /w/, /e/, /o/, /p/, /t/, /v/, /m/ sounds were already been acquired.
3. By 2yrs to 2y 3 months the /I~/i/ and /U~/u/ distinctions, and, /ɛ/, /b/, /d/, /l/, /n/, /s/, /j/, /y/ were acquired.
4. /t/, /g/, /c/, /h/ came by 2y 3months to 2y 6 months.
5. /r/ came by 4 yrs to 4 yrs. 4 months.
6. /R/ is yet to be acquired fully. The /r~/R/ distinction was yet to be established.
7. /ch/, /th/, /D/, /TH/ and /kh/ appeared by 4yrs to 4y 4months. /ch/ comes with an occasional allophonic variant /š/
8. /ɔ/ came by the age of 4 yrs. 4 months but with the allophonic variant /o/.
9. /jh/ occasionally appeared by the age of 4yrs. 4 months and yet to be acquired fully.
10. /š/ came same as /jh/ with allophone /s/. the /š~/s/ distinction was yet to be established.
11. for /dh/ and /gh/ although the process of acquisition had started by 3y 3 months, it was well established when the child went to school by 4 yrs. 4 months.
12. /ph/ is appeared with /ph~/f/ variation.
13. /bh/ didn't develop until the child entered school. After that also it was not /RH/ was not found in the entire target group. it was substituted by /R/.

14. The acquisition of tonal phoneme / / in Punjabi was not acquired fully by the bilingual children.

Tulika Chandra, thus tried to show an elaborate pattern of phonological development in Hindi-Punjabi bilingual children. Her work has been a great help during my study.

Another case study done by Suman Kalra in her 1996 M.Phil dissertation on *Early Speech and Language Development – two case studies* dealt with two female infants aged 6.5 months and 9 months taken from a similar linguistic background i.e. Hindi – Punjabi bilingual families where Hindi dominated. It was a longitudinal study done on two infants “The data was collected for a period of around eight months with weekly recordings done on a regular basis to take note of different sounds acquired at different age levels” (Kalra 1996:17). Kalra’s research was focused towards observing the cognition, language and speech production and the learning skill that developed in the two children by each passing day.

As mentioned earlier, the present study is a cross-sectional study carried out on 30 children born and brought up in a bilingual environment. The following chapter gives details of the procedural steps followed for this study.

*METHODOLOGY AND
PROCEDURAL STEPS*

The chapter on Methodology and Analytical Procedures systematically puts forth the present research problem. It gives an analytical account of the methods, procedures and techniques that have been followed while conducting the present study.

3.1 Research in Social Sciences: Approaches

Social Sciences rely on two basic approaches to research – the *Qualitative Approach* and the *Quantitative Approach*.

The *Qualitative Approach* holds good in conceptual researches which are mostly rational and are based on abstract ideas and theories, through which philosophers and researchers reinterpret the existing theories or sometimes develop new concepts, hypotheses and models to explain phenomena in nature. This is normally the kind of research for which empirical evidence is not needed.

On the other hand, *Quantitative approaches* are followed in empirical researches which are based on first hand observations and experiences. In empirical database studies, the researcher, while carrying out the research, relies on original data for analysis that ultimately leads to prove or disprove his hypothesis that had been proposed in the beginning of the study. Also known as experimental approach, this approach relies on evidence through experiments. “Empirical research is appropriate when proof is sought that certain variables affect other variables in some or the other way. Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis”. (Kothari 1985: 5)

Research in Linguistics: An Overview In Linguistic studies, the trend changed from philosophical, rational researches of the ancient times to 19th century historicism when research was national but depended on a lot of linguistic/historical evidence; to purely empirical data based descriptive approaches in the first half of the 20th century. The trends changed once again to rational grammars or innate hypothesis with Chomskyan cognitive linguistics in the mid 20th century. Rational approaches with linguistic data for evidence, the

current trend favours a combination of qualitative and quantitative approaches and a combination of empirical and rational researches.

Acquisition studies or **Child Language Research (CLR)** as it is popularly called is no exception since it combines qualitative methods with hypothesis formulation and hypothesis testing, national and subjective procedures to understand the manner in which human mind receives language data, processes it and arrives at the so called 'grammar' or 'competence' in language which enables him to use language like any other native speaker. In the present study on speech and language development in the bilingual child, the current method of research has been followed that has been discussed above.

Another variable that has been playing key role in the present bilingual study is the time factor that becomes decisive in selecting between the 'one time' research i.e. cross sectional research and the longitudinal studies conducted on a single/ a few children over a period of time.

In the longitudinal design, the research is carried on over several time periods. Time remains on the horizontal axis as one of the most important variables. Longitudinal studies require child language data collected on regular intervals, preferably short intervals, preferably short intervals, consistently by the same method so that every subsequent stage could be compared with the earlier stage to see the changes and developments in the acquisition process which in turn leads to formulation of hypotheses to explain how it must have happened. In CLR, some of the studies done by Ervin (1966) and Bloom (1970) were based on pure longitudinal studies where a single child or a group of children were observed over a period of several years recording all minute details of their gradual linguistic developments. In this approach, all other variables like gender and social class are controlled and the focus settles on the child and his language development. Longitudinal studies are effective from the point of view of the collection of a highly systematic database through recording, which helps in an errorless analysis. The only drawback in the longitudinal approach is that it is highly time consuming. "The study involves a period of months or years for growth to take place". (Good 1963: 354). Such a drawback can be overcome by

undertaking more than one longitudinal studies together and then putting a cross-sectional comparison across them.

Unlike longitudinal studies, the cross-sectional technique is confined to a single time frame. "It requires at least a single measurement for each individual within the particular groups represented". (Good 1963: 354). Besides the prime factor age, other external variables like gender, social class and family background are also considered simultaneously. The one time research has the advantage of gathering the data promptly in limited time period. In a plotted graph the time frame remains almost constant at the vertical axis for the cross-sectional technique.

The present study is based on the cross-sectional technique as the effective time period for the completion of the present research was less than one year .

3.2 The Subjects: Sampling Procedures

Deciding an effective target group that would serve the requirements of the research was the first step to start the research. Studying the speech and language development in Hindi-Punjabi bilingual children from 2 to 5 years of age was the original target of the study. The target number of subjects initially set was 50.

However, due to time constraints and non-availability of subjects on the scheduled time slot, finally we were able to get data from 30 Hindi-Punjabi bilingual children with a division of 14 males and 16 females. Since the data was collected mostly from pre-schools, Kindergartens and nursery children, getting children less than 3yrs. of age was difficult except a single child of 2y11m1day who was interviewed at home. He was the youngest among the children in the target group. The eldest child was 4y11m14days old. As each day adds to the process of linguistic development in the child, the exact age of each child in year, month and day was calculated by subtracting the date of birth from the date of recording.

To make the analysis of data easier and systematic the 30 subjects were divided into 10 groups.

The ideal gap among the age groups should have been 3 months each divided into 8 groups from age 3 to 5. But we couldn't make a neat pattern as we didn't have the same number of children in every age group. We decided to keep the youngest child in Group I who is 2y11m1day old, which could serve as a reference point for every other group. 30 subjects were distributed in 10 groups as per the nearest age gaps between the subjects.

Group II consisted of a single male child of 3y4days and three female children of 3y19days, 3y1m1day and 3y1m4days.

In Group III we placed two male children and two female children being 3y2m20 days, 3y3m28days , 3y3m12days and 3y3m13days old respectively. The age gap was very small within the group, so, these four children could easily be put together in one group.

Group IV was the largest among the groups consisting of 6 subjects – three male and three female subjects. The male children are 3y2m28days, 3y5m19days and 3y6m4days old. Among the female children one is 3y6m4days old and the rest two are of 3y6m4days and 3y6m6days each.

A single female child was kept in Group V keeping in view the age gap between her and the next child i.e. nearly 2 months. The female child is 3y7m28 days old.

Two female children were kept in Group VI who are 3y10m3days and 3y11m3 days old.

Five subjects had been put together in Group VII Group VI – two male and three female children of 4y1m18days,4y2m2days, 4y1m25days ,4y2m24days and 4y3m9days.

We placed two children in Group VIII – one male child of 4y4months and a female child of 4y5m9days.

Like Group I and Group V , Group IX was also assigned a single child who was 4y7months old.

Group X consisted of 4 subjects – three male children and one female child. The male subjects were 4y9m12days, 4y11m9days and 4y11m14days old. The female child is 4y10m5days old.

Table 1. The division of the groups :

SL. NO.	GROUP	MALE	FEMALE
1.	G I	2.11.1	
2.	G II	3.0.04	3.0.19 3.1.1 3.1.4
3.	G III	3.2.28 3.3.20	3.3.12 3.3.13
4	G IV	3.5.0 3.5.19 3.6.4	3.6.4 3.6.6 3.6.6
5	G V	–	3.7.28
6	G VI	–	3.10.3 3.11.3
7	G VII	4.1.18 4.2.2	4.1.25 4.2.24 4.3.9
8	G VIII	4.4.0	4.5.9
9	G IX	4.7.0	–
10	G X	4.9.12 4.11.9 4.11.14	4.10.5

With the basic tabulation and grouping done, we move on to the next chapter which deals with observation and analysis of the compiled data.

3.3 Elicitation Procedures:

The Test: Before starting the actual field work, a certain amount of ground work was done to prepare an effective set of test materials that would suit the age group of the subjects. Pictorial questionnaires with colourful pictures were used to elicit responses from children.

To select the pictures, the vowel and consonant phonemes of both the languages were studied closely. The phoneme chart of both the languages obtained from different sources are presented below.(see charts 1,2,3,4) As Hindi and Punjabi are cognate languages belonging to the Indo-Aryan Language family, they have many phonemes in common and only a few which are unique to each language.

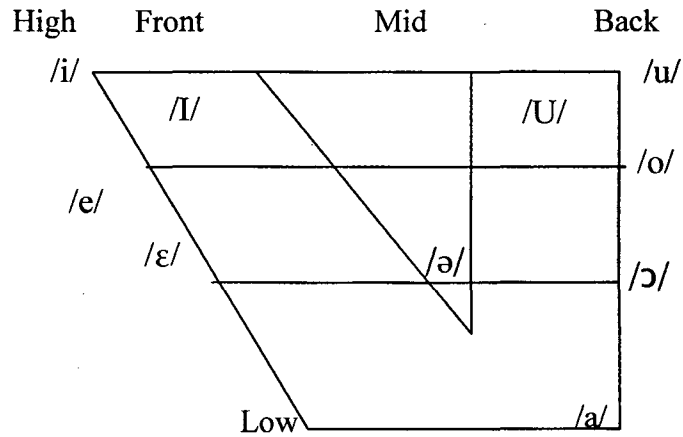
Chart 1. Consonant phonemes of Punjabi :

		Bilabial	Labio-Dental	Dental/Alveolar	Retroflex	Palatal	Velar	Uvular
Stop	vl vd	p p b h		t th d	T Th D		k kh g	
Affricates	vl vd	s z	(f) (v)			ʃ		h
Nasals	vl vd		m	n	N			
Laterals				l	[L]			
Trills				r				
Flaps					R			
Approximants	[w]					[y]		

[L] found in dialectal varieties of Punjabi.

(Gill and Gleason: 1972)

Chart 2. Vowel Phonemes of Punjabi :



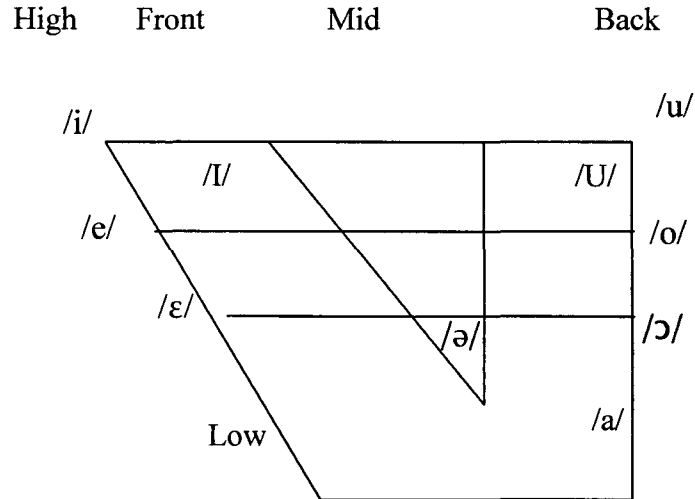
(Gill and Gleason:1972)

Chart 3. Consonant Phonemes of Hindi :

P.O.A		Bilabial	Labio-Dental	Dental Alveolar	Retroflex	Palatal	Velar	Uvular
Stops	vl vd	p ph b bh		t th d dh	T Th D Dh		k kh g gh	
Affricates	vl vd					c ch j jh		
Fricatives	vl vd		(f) v	s z		š		h
Nasals	vl vd		m	n	N		ŋ	
Laterals				l	[L]			
Trills				r				
Flaps					R Rh			
Approximants	w					y		

(Narang: 1984, i)

Chart 4. Vowel Phonemes of Hindi:



(Narang 1984: i)

A comparison of Hindi and Punjabi consonant phonemes:

Hindi has a 4 way contrast in stop consonants as in p-ph-b-bh, t-th,-d-dh, T-Th-D-Dh, c-ch-j-jh and k-kh-g-g-h. As compared to this Punjabi has a 3 way contrast in stop consonants as the voiced aspirates of Hindi become the corresponding voiceless stop followed by low t one in the following vowel word initially. Medially Punjabi has a voiced stop followed by low tone and in final position, the voiced stop is preceded by high tone.

Likewise, the alveolar retroflex /L/ and the nasal retroflex /N/ are found in the dialectical variations of Punjabi. /N/ is occasionally found in informal varieties of Hindi taught to the child in formal school situation.

Besides this, tone is a marked feature in Punjabi. 3 types of tones are identified in Punjabi –

Level tone /-/

High rising /-/

Falling rising /✓/

(Gleason and Gill, 1972: 75)

After a detailed observation done on the phoneme charts, a set of 41 phonemes and 114 test words were considered for the test.

Table.2. Total no. of vowel and consonant phonemes and test words taken for the test:

Vowel phonemes 10	Consonant phonemes 31
Test words 24	Test words 90

The Test Words: Words, mostly nouns in everyday use were considered for data elicitation. Words appropriate for children of the tested age group were chosen to put each phoneme in the word initial (WI) word medial (WM) and word final (WF) positions. Pictures corresponding to the words were collected and arranged in sequence in the picture chart. The phonemes and the words selected have been put in sequence in Chart 6. The word positions where nouns could not suffice for, in those positions verbs and adverbs were taken instead. For eg.

/Rh/ in WF position - /cəRh/, /pəRh/

/ε/ in WF position - /hε/

/w/ in wI position - /wəhã/

/o/ in WF position - /ao/

/y/ in WI position - /yəhã/

In some other cases where pictures could not suffice for data elicitation, real tangible objects were shown as in for /asman/, the child was pointed up above the sky, for /iT/, a piece of block was given to the child, for /əThənni/, a 50 paise coin was shown. Sometimes objects around which were familiar to the child were also added to the elicitation procedure. Response charts were made corresponding to the phonemes listed in the test chart. The list of the words used initially are listed below. The word list is followed by a sample of the response sheet, where the responses of children were noted down.

Speech sounds tested along with the test words selected for the test are listed below :

Chart 5 List of phonemes along with test words :

Sl. No.	Phonemes	Initial	Medial	Final
1.	/p/	pətəŋ	pəpʌta	kəp
2.	/ph/	phul	sitaphəl	
3.	/b/	bəndər	kəbutər	gulab
4.	/bh//p /	bhalu, bhInDi	phulgobhi	jʌbh
5.	/t/	tərbuz	chətʀi, kutta	rat ,sat
6.	/th/	thali	hathi	hath
7.	/d/	dada	dadi	əmrud
8.	/dh//t /	dhənuš	gədha, adha	dudh
9.	/T/	TəmaTər	məTər	ūt
10.	/Th/	ThənDa	əThənni	aTh
11.	/D/	Dəmru	ənDa jhənDa	ThənD
12.	/Dh//T /	Dhəkkən	gəDDha	-
13.	/c/	cəmməc cita	bəcca	cəmməc
14.	/ch/	chətʀi	məchli	pūch
15.	/j/	jəhaz, jəg	gajər	surəj
16.	/jh//c /	jhənda, jhaRu	mənjhla	sānjh
17.	/k/	kela	bəkri	ləRka
18.	/kh/	khərgoš	məkkhən rəkhna	āk
19.	/g/	gay	bəŋgən	ag
20.	/gh//k /	ghər	kəŋghi	bagh

21.	/m/	məchli	lomRi, Imli	am
22.	/n/	nəl	ənar	kan
23.	/h/	hathi	jəhaz	bāh
24.	/r/	rel	gərəm	əŋgur
25.	/R/	-	ləRka ghəRa	ləR
26.	/Rh/	-	cəRho	cəRh, pəRh
27.	/l/	lal	pila	lal
28.	/s/	səntəra	asman	pyas
29.	/š/	šer	šiša	taš
30.	/z/	zebra	maza	jahaz
31.	/y/	yəhā	narlyəl	gay
32.	/w/	wəhā	kəuwa	pāw
33.	/i/	ĩT	cita	hathi
34.	/I/	Imli	ciTThi	-
35.	/e/	ek	khel	kele
36.	/ɛ/	ɛnək	pəse, bəl	hɛ
37.	/a/	am	bhalu	khira
38.	/o/	okhli	khərgoš	ao, foto
39.	/U/	ullu	kUta	-
40.	/u/	ũT	muli	bhalu
41.	/ə/	ənar	cəmməc	-

RESPONSE SHEET

NAME : M/F:
 MT : L1:
 DATE OF BIRTH :
 DATE :

SL. NO	PHONEMES	WORD POSITIONS			COMMENTS
		W. INITIAL	W. MEDIAL	W. FINAL	
1.	/p/				
2.	/ph/				
3.	/b/				
4.	/bh//p /				
5.	/t/				
6.	/th/				
7.	/d/				
8.	/dh//t /				
9.	/T/				
10.	/Th/				
11.	/D/				
12.	/Dh//T /				
13.	/c/				
14.	/ch/				
15.	/j/				
16.	/jh//c /				
17.	/k/				
18.	/kh/				
19.	/g/				

20.	/gh//k /				
21	/m/				
22.	/n/				
23.	/h/				
24.	/r/				
25.	/R/				
26.	/Rh/				
27.	/l/				
28.	/s/				
29.	/š/				
30.	/z/				
31.	/y/				
32.	/w/				
33.	/i/				
34.	/I/				
35.	/e/				
36.	/ε/				
37.	/a/				
38.	/o/				
39.	/U/				
40.	/u/				
41.	/ə/				

3.4 Testing The Validity of The Test: Pre-testing

Before interviewing the real target group, the word list was taken for a pre-testing. Two children from the older age group (between 5 to 6 yrs) were chosen and were interviewed with the word list. It was noted that vowel phoneme

/ɔ/ was being substituted by /o/ by both the children. Exception was English word ‘ball’ /bɔl/, which was pronounced correctly. /ph/ fluctuated with /f/. The /R/ ~ /Rh/ distinction was not yet found since /Rh/ was still pronounced as /R/. Looking at the responses of this older age group, /ɔ/ and /Rh/ sounds were eliminated from the test.

Some test words could not be identified even by the older age group. Presuming that the target group might also face difficulty recognizing or uttering those words, they were replaced by other words as /ikh/ was replaced by /iT/, /rəθ/ was replaced by /rel/ and /dhənuʃ/ was replaced by /dhəkka/

In Hindi /I/, /U/ and /ə/ do not occur in the WF position. Like wise /Dh/ and /R/ do not occur in the WI position. So, these positions were left untested for these phonemes.

3.5 The Field Work: Data Elicitation

With the final test chart and picture chart ready for data collection, pre-schools, Kindergartens and nurseries were visited to get Hindi-Punjabi bilingual children of the required age group. 30 samples were collected ranging from the lowest age of 2y11m1day to the eldest age of 4y11m14days. Some of the children were also visited at their homes. Every time the test was tried to be conducted in a separate place where there would be lesser interference of outsiders or other children, though every time it was not so easy to minimize disturbances. In most of the cases the children used to take some time to get familiar with the researcher. As both of them got used to each other, the researcher would start slowly, one by one with the pictures and would try to get them identified by the child. The child was specifically asked to identify the objects in Hindi. In most of the children, high dominance of English was found. However, the responses were noted immediately and in case of confusion about any sound, the child was asked to repeat it. Although options for imitation had been considered earlier, it was allowed only when the researcher was falling short of any second word for any specific phoneme. For eg. /dhənuʃ/, /okhli/,

/mənʝhla/, /gəDDha/ and /thali/ were pronounced with the help of imitation.

Finally the blank response sheets were filled up with 3 kind of responses.

- A correct response was assigned a tick mark: (√)
- A no response to the word was assigned a cross mark: (x)
- Variations and substitution in phonemes were shown individually.

3.6 Tabulation and Analysis

On a preliminary basis the 30 sets of response sheets were compiled and put on a chart in a tabular form. In the horizontal X axis the subjects were numbered (1-30) in the increasing order of their ages and all phonemes were listed on the vertical Y axis. Different types of responses (correct responses, no responses and substitutions) were compiled on the table. The responses of the male and female subjects in each one of the ten groups (as divided earlier) were studied separately and also with reference to the first group i.e. the youngest child who is less than 3yrs of age.

3.7 Chapterization:

Chapter I starts with an introduction to language and proceeds with brief descriptions on the theories of language learning with their significance to Child Language Studies. The stages of child language development have also been touched briefly with their relevance to child language research. Although the major section of the chapter deals with studies related to Paedolinguistics, a small section of the chapter also deals with the problematic in CLR which focuses on child speech and language disorder and speech pathology. The chapter ends with a brief note on the aim and objective of the present study.

Chapter II discusses the background studies and literature reviews in the field of CLS that are found relevant to the present study. Starting with the description of the historical time periods, it moves on to literature reviews on language development in monolingual and bilingual children. The chapter ends with a brief description of three different bilingual studies done in Indian multilingual set-up.

Chapter III, the current chapter is on the methods and procedural steps taken for the present study, which discusses the data elicitation, grouping and tabulation on pages.

Chapter IV includes the analysis and discussion on the data, obtained from each one of the 30 subjects. (from pages

Chapter V, the last chapter deals with a brief summary and conclusion which is followed by a select bibliography from pages.

ANALYSIS AND DISCUSSION

4.1 As discussed earlier in the previous chapter on ‘Methodology and Procedural Steps’, the 30 subjects are divided into 10 groups .The division of groups have been mentioned in the previous chapter on p .no.35.

Data elicitation for the study was done on the basis of the chosen test words with reference to the test phonemes put in the WI, WM and WF positions. The words taken for the test are listed in section 3.3 (pp. 40-41) of the previous chapter. Pictures were gathered in the picture chart corresponding to the sequence of the test words. The responses of the children were noted down in response sheets. Each response sheet contained personal details such as *name, gender, MT, L1, date of birth and date of recording* of the child. The rest of the response sheet contained tabulated blank spaces for noting down the responses. Having a complete list of phonemes listed in one column, the blank spaces also contained 3 blank columns for *WI, WM, and WF responses* along with one extra column for *comments*. The response sheet consisting of 3 pages was assigned one each to every subject tested.(refer to section 3.3 pp. 43-44 of chapter III).

The analysis on the data thus elicited has been discussed in detail in the following section beginning with a detailed description of the youngest child and his responses to the test words. This child, the only one in the group (GI) is being discussed separately in detail for two reasons – first, to see what are the speech sounds that are normally achieved by the time the child reaches close to the age of 3 and secondly, the information and the data taken from the child under 3 is further used as a reference point to analyse the phonological patterns shown by the subjects of other groups.

4.2 The original response sheet of the child in GI is being reproduced here –

NAME : PRATIK

M/F: M

MT : Punjabi

SL: Hindi

DATE OF BIRTH : 03/11/99

DATE : 04/12/2002

Sl.No.	CONSONANT PHONEMES	POSITIONS			COMMENTS
		W. INITIAL	W. MEDIAL	W. FINAL	
1.	/p/	✓	✓	✓	
2.	/ph/	X	X		no response to the test words
3.	/b/	✓	✓	✓	
4.	/bh/ /p̄v/	/b̄w/	X	/sib/	/bh/ → /b/
5.	/t/	✓	✓	✓	
6.	/th/	/tali/	/hati/	/bat/	/th/ → /t/
7.	/d/	✓	✓	✓	
8.	/dh/ /t̄v/	/d̄ka/	/ada/	/dud/	/dh/ → /d/
9.	/T/	/tomator/	/mator/	/ūt/	/T/ → /t/
10.	/TH/	/ithanni/	/ethanni/	/ath/	/TH/ → /th/
11.	/D/	X	/anda/	X	/D/ → /d/
12.	/DH/ /T̄v/	X	X	X	does not respond to the test words
13.	/c/	✓	✓	✓	
14.	/ch/	✓	✓	✓	
15.	/j/	X	X	✓	
16.	/jh/ /c̄v/	X	X	X	does not identify the test words.

17.	/k/	/tela/	/batoi/	/et/	/k/ → /t/
18.	/kh/	✓	✓	✓	
19.	/g/	/dae/	/bendon/	/ad/	/g/ → /d/
20.	/gh/ /k̄/	/d̄or/	/t̄ondi/	x	
21.	/m/	✓	✓	✓	
22.	/n/	✓	✓	✓	
23.	/h/	/he/	x	x	
24.	/r/	✓	✓	✓	
25.	/ʀ/	✓	✓		
26.	/RH/	x	x		
27.	/ʀ/	✓	✓	✓	
28.	/s/	✓	✓	✓	
29.	/š/	x	x	x	none of the test words recognized
30.	/z/	x	✓	x	
31.	/y/	✓	/dae/	x	
32.	/w/	✓	x	x	
33.					
34.					

NAME :

M/F:

MT :

SL:

DATE OF BIRTH :

DATE :

Sl.No.	VOWEL PHONEMES	POSITIONS			COMMENTS
		W. INITIAL	W. MEDIAL	W. FINAL	
1.	/i/	✓	✓	✓	
2.	/I/	✓	✓		
3.	/e/	✓	✓		
4.	/ɛ/	x	x	✓	no response to the test words
5.	/a/	✓	✓	✓	
6.	/o/	x	✓	✓	Lexical item not recognized.
7.	/ʊ/	✓	✓		
8.	/u/	✓	✓		
9.	/ə/	✓	✓		
10.					
11.					
12.					
13.					
14.					

4.3 *Analysis and discussion on GROUP I (GI):*

Group I consists of a single male child of 2 y 11m. As he was the only subject below the age of 3, he was kept in one group. The child was Pratik, whom we interviewed in one of the crèches where he was spending 5 to 6 hours a day with other children (both males and females) belonging to different linguistic backgrounds. He was an active and articulate child friendly with other children and the caretakers. We didn't face much problem collecting data from him although difficulty arose occasionally when he was not able to recognize the test words. Some of the phonemes thus remained unidentified due to the fact that the lexical items were unfamiliar. Moreover, the child was a normal and responsive subject to start with, whose responses are considered as a reference point for the rest of the nine groups from Group II to Group X. The response chart of the child is attached *here for ready reference*.

The Vowels

- The child's responses are correct for the vowel phonemes /i/, /I/, /e/, /a/ /o/, /U/, /u/ and /ə/ in all test words in all three words positions. In Hindi the vowel phonemes /I/, /U/ and /ə/ tend to be prolonged in word final positions. So, these three vowels were tested only in the word initial and word medial positions. All other vowel phonemes were tested in all the three word positions.
- Clear contrasts appear in vowel phonemes /i~/I/ and /u~/U/. The child differentiated between /i/ and /I/ through correct responses for test words /ĩt/, /cĩta/ and /hathi/. Although there were problems in the consonant phonemes, the /i/ sound was clearly recognized for /I/ the child rightly recognized /Imli/ and /billi/ as the words seemed to be much familiar to the child.
- /u/ was uttered correctly in test words /ũt/, /mulu/ and /bhalu/.
- Short /U/ was also recognized correctly with test words /Ullu/ and /kũtta/

- The child shows correct and clear contrast in /i/~/ɪ/ and /u/~/ʊ/.
- Vowel phoneme /e/ was tested through words like /ek/, /kela/, /kele/ and was noted that /e/ has been acquired correctly by the child.
- Acquisition of vowel phoneme /o/ was correctly recognized in test words /khərgoʃ/ and /ao/ i.e. in the WM and WF positions except for the test word /okhli/ where /o/ appears in the WI position. The child could not recognize the picture of an /okhli/ as the concept / word might not be there in the child's verbal repertoire. Except for test word /okhli/, we can presume that vowel phoneme /o/ has already appeared in the child's phonemic repertoire.
- For vowel phoneme /ə/, the child responded to the test words /ənar/ and /cəmməc/ correctly as the words seem to be in frequent use in everyday life.
- The child recognised the test words /am/, /bhalu/ and /khira/ without any difficulty.
- Vowel phoneme /ɛ/ was difficult for him pronounce through the prescribed test words /ɛnək/, /bɛl/ and /pɛse/. The reason could be the unfamiliarity of the child with these words. However, when tested with Hindi auxiliary /hɛ/, the child spoke it clearly with clear WF /ɛ/. So, inspite of the vocabulary constraints, vowel phoneme /ɛ/ appeared in the child's speech.
- Vowel /ɔ/ was not tested for reasons as explained in the section on pre-testing in the chapter III (p. no. 43).
- Among the consonant phonemes, that have fully been acquired are /p/, /b/, /t/, /d/, /c/, /ch/, /kh/, /m/, /n/, /r/, /R/, /l/ and /s/ in all the three test word positions.

The Stops

- /p/-/b/ contrast has correct responses, in all the three word positions. Test words taken for /p/ were /pyaz/, /pəpita/ and /kəp/.
- Voiceless aspirate /ph/ doesn't appear in his responses, the test words taken being /phulgobhi/ and /sɪtaphəɪ/. May be these words are not in the child's every day use. /ph/ was not tested in the final position.
- The /p/ ~ /ph/ contrast is yet to be established.
- Voiced aspirate /bh/ is substituted by /b/ in the test words /bhalu/ and /jibh/ which are pronounced as /balu/ and /jib/ respectively. The child could not identify /gobhi/.
- /t~/d/ alveolar stops show clear contrast in all there word positions. The test words taken for /t/ are /cita/, /sat/ and the test words for /d/ are - /dada/, /dadi/, /əmrud/.
- All the above test words were recognized and pronounced clearly by the child.
- Voiceless alveolar aspirate /th/gets substituted by /t/ in test words as /thali/→/tali/, /hathi/→/hati/ and /hath/→/hat/.
- Voiced alveolar aspirate /dh/ is substituted by /d/ as /adha/→/ada/, /dudh/→/dud/. The child recognizes and pronounce /dhəkka/ as /dəkka/.

The Affricates

- /the child has acquired c/ correctly. He rightly responds to the test words /cəmməc/ and /bəcca/.
- Acquisition of /j/ is not clear as the child doesn't respond to the test words /jəhaz/ and /gajət/. When another word /aj/ was tried, he uttered it clearly.

The other two words might not be there in the child's verbal repertoire. We can see that /j/ appears in the child's repertoire in the word final position.

- Voiceless aspirate /ch/ occurs in all three word positions, the test words being /chətri/, /məchli/ and /pũch/. The child recognizes all the three lexical items.
- The /c~/ch/ contrast is clearly established in the child's repertoire.
- Voiced aspirate /jh/ acquisition is not clear as the child doesn't respond to the test words /jhaRu/, /mənjhla/ and /sānjh/. It was difficult to derive any conclusion about the acquisition of /jh/ in the child.
- The /j~/jh/ contrast could not be verified in the child due to lack of response to test words. The problem seems to be more with the lexical items than the sounds.

The Velars

- The voiceless velar stop /k/ does not appear in the child and is substituted by alveolar stop /t/ in all the three word positions as in /kela/→/tela/, /bəkri/→/bəttri/ and /ləRka/→/ləRta/.
- Voiced velar /g/ also has not yet been acquired and is substituted by voiced dental stop /d/ in all the three word positions as the child substitutes /gay/ as /dae/, /əgərbətti/ as /ədərbətti/ and /ag/as /ad/.
- The child substitutes /k/ by /t/ but for its aspirated counter part /kh/ surprisingly the child responds to all the test words - /khira/, /khərgoš/, /ākh/, /məkkhən/ with correct pronunciation of /kh/.
- The voiced aspirate /gh/ is again substituted by dental alveolar /d/ as /ghər/ →/dər/ and /kəŋghi/→/təndi/. The test word /bagh/ (/gh/ in WF position) is substituted by /šer/ as the word /bagh/, doesn't seem to be familiar and the

word /šer/ is used to recognize the picture of a tiger or a lion in the picture chart.

- It seems that in the child's phonology, there must have been a complete substitution of velars by dentals and perhaps at the age of 2.11 (around the time of recording) /kh/ appears in some familiar words like /mækkhən/, /khira/ khərgoš/ and /ākh/.

The two possible explanations for this could be:

- (a) The child has the /t~/d/ contrast but not the aspirates as yet so, there is no question of substitution of /kh/ by /th/ which is difficult for him to pronounce anyways.
- (b) Velars are just beginning to appear may be through some of these very familiar lexical items, used in test words for /kh/. However, in most of these words aspiration seems to be 'emphasis' for this child.

The Retroflex Sounds

- The voiceless retroflex /T/→t/ in all word positions as /TəmaTər/→/təmatər/, /məTər/→/mətər/ and /üt/→/üt/. The child shows familiarity with the lexical items and the test words.
- Acquisition of voiced retroflex /D/ is not clear as the child recognizes only one test word /ənDa/ which he substitutes as /ənda/
- However as /D/→d/ we can make the hypothesis that the child substitutes retroflex by dentals. Lexical items /Dəmru/ and /jhənDa/ are not recognized by the child.
- Voiceless aspirate /Th/ is substituted by /th/ as /ThənDa/→/thənda/, /əThənni/→/əthənni/ and /aTh/→/ath/.

- The child did not show any difficulty in identifying the test words along with the lexical items.
- The voiced aspirated retroflex /Dh/ did not get any responses from the child as she fails to recognize the test words.
- The subject faced problems in the acquisition of retroflexes both through the recognition of test words and the test sounds as well. The retroflexes are yet to appear in the child who is less than 3yrs.

The Trill

The child showed correct responses for /r/ in all the three word positions without any variations or substitutions. The test words taken were /rel/, /gəɾəm/ and /əŋgur/.

The Flap

/R/ appeared in the test words without any substitutions or variations. It was tested in words like /ləRka/ and /ləR/. In Hindi /R/ doesn't occur word initially.

The Fricatives

- Voiceless fricative /s/ was clearly articulated in all the three word positions, the test words being /səntəɾa/, /asman/ and /pyas/. The child responded clearly to all the three test words.
- Voiced fricative /z/ could be traced only in one word /maza/ which is a famous brand name for a soft drink seems to be very much familiar to the child. Other words like /jəhaz/ and /zebra/ were not recognized by the child. It might be due to the exposure to visual media that the child could identify the word /maza/. As we notice the pronunciation of /z/ in this word we assume that the child has acquired the sound.

- As no other word could be tested for /z/, the /s~/z/ contrast did not become clear in the child.
- /š/ acquisition was not noted as the child doesn't respond to the test words /šiša/ and /šer/.
- Fricative /h/ appeared in the child through the Hindi auxiliary /hə/ and another test word /hathi/. Test words /jəhaz/ and /bāh/ were not responded by him. But as /h/ appears in two of the test words (although only in the WI position) we assume that the child has acquired /h/ as a distinct sound.

The Lateral

- /l/ appears clearly in all three word positions. The test words /lal/ and /pila/ were recognized and pronounced clearly by the child. The test also confirms the child's knowledge of colour terms.

The Nasals

- Nasals /m/ and /n/ were tested and they appear clearly in the child's repertoire in all the test word positions as in /məchli/, /lmi/ and /am/ for /m/ and /nəlka/, /ənər/ and /bɛŋgən/ for /n/.
- /n/ was not substituted by /N/ as found in Punjabi.

The Approximants

- The palatal approximant /y/ occurred clearly in the WI position in /yəhā/ it became /e/ in the word final position as /gay/→/gae/ which is also true of the adult native pronunciation.
- The WM test word /narlyəl/ was not recognized by the child.
- The lexical constraints made it difficult to get any clear picture regarding the acquisition of /y/.

- Bilabial approximant /w/ also got only one correct response by the child in the test word /wəhã/. Other test words for /w/ like /kəuwa/ and /pāw/ were not recognized by the child. Here also vocabulary became a constraint to know about the acquisition of /w/ in the child.

However, we assume that /y/ and /w/ are beginning to appear in the articulation of this child.

The responses of the rest of the 29 children along with the youngest child have been compiled in a summary chart (Chart.5) for ready reference during the analysis and comparison of the database.

4.3 The group wise analysis and discussion are presented after the summary chart.

Age →	M	M	F	F	F	M	F	F	M	M	M	F	M	F	F	F	F	F	M	F ²⁰	M	F	F	M	F	M	M	F	M	M
Phonemes ↓	2.11.1	3.0.4	3.0.19	3.1.1	3.1.4	3.2.28	3.3.12	3.3.13	3.3.20	3.5.0	3.5.29	3.6.4	3.6.4	3.6.6	3.6.6	3.7.28	3.10.3	3.11.3	4.1.18	4.1.25	4.2.2	4.2.24	4.3.9	4.4.0	4.5.9	4.7.0	4.9.12	4.10.5	4.11.9	4.11.14
/i/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/u/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/e/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/ɛ/	X	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/œ/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/o/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/y/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/u/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/œ/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/p/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/pʰ/	X	X	X	X	/p/	/p/	/p/	√	/p/	√	√	√	√	√	√	√	/t/	√	/t/	√	√	/t/	/t/	/t/	/t/	/t/	/t/	/t/	/t/	/t/
/b/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/bʰ/ /p /	/b/	√	√	/b/	√	/b/	/b/	/pʰ/ / /b/	√	/b/	√	/b/	√	/b/	/b/	/b/	/b/	/b/	√	√	√	√	√	√	√	/pʰ/ / /p/	√	√	√	√
/t/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/tʰ/	/t/	/t/	/t/	/t/	/t/	/t/	√	/t/	√	√	√	√	√	√	√	/t/	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/d/	√	√	/d/	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
/dʰ/ /t /	/d/	WF /d/	√	/d/	/d/	√	√	√	/d/	/d/	/d/	√	/d/	/d/	√	√	/d/	/d/	√	/d/	√	/d/	√	√	√	√	√	√	√	√
/tʃ/	/t/	/t/	/t/ / /tʃ/	/t/	/t/	/t/	√	√	√	/t/	/t/	√	/t/	/t/	/t/	/t/	√	√	√	√	/t/	√	√	/t/	√	√	√	√	√	√
/tʰ/	/tʰ/	/tʰ/	/tʰ/	/tʰ/	/tʰ/	/tʰ/	/tʰ/	√	√	/tʰ/ / /tʰ/	/tʰ/	√	/tʰ/	/tʰ/	/tʰ/	/tʰ/	√	/tʰ/	/tʰ/	/tʰ/	/tʰ/	√	√	/tʰ/	√	√	√	√	√	√
/dʃ/	WM /d/	/d/	/d/	/d/	/d/	/d/	/d/	/d/	/d/	/d/	/d/	√	/d/	/d/	/d/	/d/	√	√	/d/	/d/	√	√	/d/	√	√	√	√	√	√	√

GROUP II (GII)

GII consists of four subjects – one male child of 3y 4 days and the females are 3y 19 days, 3 y 1m 1 day and 3y 1m 4 days old respectively.

Speech sounds found in common between GI and GII:

All the vowels acquired correctly by GI appear with the same clarity in GII. All the subjects of GII show correct responses to /i/, /I/, /e/, /a/, /o/, /u/, /U/, and /ə/ with /i/~I/, /u/~U/ and /e/~ε/ clear contrasts. No such vowel is noted which has correct response in GI and is not responded to by GII.

Among the consonant sounds, the bilabial consonants /p/, /b/, /t/, /d/ along with their respective contrasts, /j/ among the affricates, /R/ the flap, the dental fricatives /s/ and /z/ in contrast, fricative /h/, lateral /l/, the nasals /m/, /n/ and the approximants /y/ and /w/ have been acquired clearly and correctly by both the groups.

Correct responses in GI but variations in GII

Four consonant speech sounds - /c/, /ch/, /kh/ and /t/ are noted which appear correctly in all the test words in all the three positions in GI but the responses of GII children show lots of variation in all.

Description

- **Voiceless palatal affricate /c/** is clearly acquired by GI. All the subjects in GII except for the single male child (3.0.4) acquire /c/ correctly. The male child substitutes /c/ by /s/ in the WF position as /cəmməc/→/cəmməs/. 11 out of 12 responses are correct. It can be assumed that /c/ appears in the group but with variation that could be eclectic.
- **Voiceless palatal aspirated affricate /ch/** appears in all three word positions in GI. The same sound doesn't appear consistently in GII. One female child

(3.1.4) substitutes the aspirated affricate by the voiceless labiodental fricative /s/ in all word positions. The substitutions made are /chətrɪ:/→/sətri/, /mæchli/→/məsli/ and /puch/→/pus/. Out of 12 responses, 9 responses are correct. We assume that /ch/ appears in the age group. The substitution shown by the child could be idiosyncratic.

- The **voiceless velar aspirate /kh/** was acquired correctly by GI.

In GII, although there is correct response to /kh/ by the subjects, the male child in the group (3.0.4) substitutes /kh/ by dental stop /t/ as /khərgoš/→/tərgoš/, /mækkhən/→/mättən/ and /ākh/→/āt/. 9 out of 12 responses are correct.

The test words used for /kh/ were easily identified by all subjects. So, for the male child, the problem seems to be more with the acquisition of the velar aspirate phoneme rather than with the acquisition of the test words.

This variations / substitutions can be better explained with the other velar substitutions by dentals in the speech of the same child.

- Although the **trill /r/** appeared clearly in the child in GI, it shows no consistency in GII. It shows three variations - /r/, /l/ and /R/ by different subjects in different word positions.

In this group, the single male child is the only subject who responds to /r/ correctly in all word positions.

Two among the females (3.0.19 and 3.1.4) show substitution of /r/ by /R/ in all the word positions - /rel/→/Rel/, /gərəm/→/gəRəm/ and /əngur/→/ənguR/.

Another female child (3.1.1) substitutes /r/ by /l/ in the medial position as /gərəm/→/gələm/. Other two tests words are pronounced correctly.

The subjects, no doubt, identify the test words with much familiarity. The variations in the phoneme in certain word positions could be due to the clarity in acquisition of /r/ which is yet to be established uniformly in this age group.

3 out of 8 responses are correct. It is interesting to note that /R/ as a phoneme maybe present at phonological level in contrast with /l/ and in some cases with /r/ also, but /r/ as a phoneme with clear articulation and clear contrast with the other two sounds is only beginning to establish at this stage.

New contrasts in GII:

- /bh/, /jh/, /k/, /g/, /gh/ and /s/ are the consonant speech sounds **which** didn't appear in the child in GI and emerge in some responses of GII.

Description

- In GI the **bilabial voiced aspirate /bh/** shows substitution with /b/, its unaspirated counterpart. As compared to GI, in GII /bh/ appears clearly in three members of the group i.e. in the male (3.0.4) and in two females (3.0.1 and 3.1.4.) as all three of them responded to the test words correctly without any difficulty.

Only one among the three females (3.1.1) substitutes /bh/ by /b/. Her responses were /bhalu/→/balu/, /gobhi/→/gobi/ and /jibh/→/jib/.

The analysis shows that 9 out of 12 responses are correct. Hence, it can be assumed the /bh/ has been acquired by the age group and the variation noted is eclectic. /bh/ emerges correctly in 3 subjects and a single subject substitutes it by /b/. We presume that although /bh/ appears in GII, its acquisition and the /b/~ /bh/ contrast is yet to appear in the age group.

The voiced aspirated affricate /jh/ is another consonant speech sound which got no response in GI as the child did not respond to any of the test words. Unlike GI, in GII /jh/ appears in the females but in a single word / jhaRu/ where /jh/ occurs in the WI position. The children don't seem to be familiar with the

other two test words /mənjhla/ and /sanjh/. However, the female subjects could speak /mənjhla/ when the cue word is provided (by imitation).

The male child in the group does not identify a single test word even through imitation. The problem seems to be more with the lexical items than with the test words

Though 6 out of 8 responses are correct, the responses for WF /Jh/ are not counted, as the children do not recognize the test words. It needs to be tested further with different test words.

The /j/~ /jh/ contrast is yet to attain clarity and uniformity in the group but it definitely appears in the WI position in the articulation of three out of four subjects and in both the words /jhanDa/ and /jhaRu/ where /jh/ occurs in the WI position.

- The **velars** /k/, /kh/, /g/, /gh/ are substituted by their dental counterparts in the male child in the group. The substitution of velar by dental by the child in the phoneme /kh/ has already been discussed earlier. It is interesting to note that the same also child also substitutes the other velars /k/, /g/ and /gh/ by their dental counterparts /t/, /d/ and /dh/ as in the child's speech.

/kela/→/tela/, /bəkri/→/bəttri/ and /ek/→/et/

/gay/→/day/, /bɛŋgən/→/bɛndən/ and /ag/→/ad/

/ghər/→/dhər/, /kəŋghi/→/təndhi/

Other subjects of the group i.e. the 3 female children respond correctly to the phonemes as well as the test words except for /bagh/ where /gh/ lies in the WF position, none of the subject could recognize the word. All of them substitute it by / šer/.

The analysis shows out of 32 responses in total 24 responses were correct in the acquisition of velars. The substitutions noted in the male child seems to be

eclectic or might be due to the age factor as the child has just reached 3 years, and all other subject being older to him.

- Acquisition of **palatal fricative /š/** was not clear in GI as the child had not responded to any of the test words. However, the females in GII have acquired /š/ clearly where as the male child substitutes it by /ch/ as /šer/→/cher/ in the child's speech. Another test word /šiša/ is not recognized by the male child.

6 out of 8 responses are noted to be correct for /š/ in the whole group.

We have seen earlier that the male child in GII substitutes /ch/ by /s/ and now the responses reveal that he substitutes /š/ by /ch/. The assumption could be that, /š/ has not yet appeared in his phonemic repertoire and it is in the process of acquisition in this child. The other members of the group however articulate the phoneme correctly.

- Consonant speech sounds /ph/, /th/, /gh/, /t/, /th/, /td/, /d/ and /dh/ are the phonemes which have got substituted by other phonemes in GII. None of these sounds appear in GI.

Description

- In GII, the **voiceless bilabial stop aspirate /ph/** is substituted by /p/ in the speech of a single female child (3.1.4) as /phulgobhi/→/pulgobi/ and /sitaphəl/→/sitapəl/. The child recognizes the test words correctly.

The other 3 subjects (1 male child and 2 female children) do not respond to the test words may be due to the unfamiliarity with the test words.

- In GII the voiceless alveolar stop aspirate /th/ consistently gets substituted by /t/, its dental counterpart in all the word positions. However, the subjects identified the test pictures correctly without any difficulty. Here the problem seems to be more with the phoneme rather than with the lexical items. In the whole group

/thali/→/tali/, /hathi/→/hati/ and /hath/→/hat/.

The analysis shows that /th/ has not begun to appear in the group.

- The 3 female subjects substitute the **alveolar stop aspirate /dh/** by /d/ in all word positions except for the single male child who shows unfamiliarity with the test words, recognizes a single test word /dudh/ which is a word in common use and thus, doesn't not clarify the acquisition of /dh/.

The substitutions for /dh/ in the test words are

/dhəkka/→/dəkka/, /adha/→/ada/ and /dudh/→/dud/

/dh/ is yet to be acquired correctly by all members of the group.

The over all responses show that the age group is yet to acquire the aspirate~nonaspirate contrast in case of the dental stops.

- No correct responses to the test words for the four **retroflexes i.e. /T/, /Th/, /D/ and /Dh/**. Variations/substitutions noted in the retroflex sounds are as follows –
- **Voiceless retroflex /T/** is substituted by dental stop /t/ by two female subjects (3.1.1,3.1.4). In another female child (3.0.19), /T/ appears correctly in the WM position as /TəmaTəɾ/→/təmaTəɾ/. The child substitutes the WI /T/ by dental /t/.

On the contrary the male child substitutes /T/ by /t/ word medially when he pronounces / TəmaTəɾ/ as /Təmatəɾ/ and /məTəɾ/ as /mətəɾ/

All the four subjects in the group substitute /T/ by /t/ in the WF position (in the test word /ūT/ without any exceptions.

It seems, the children in this age group, all male and females are in the process of acquiring the /t~/T/ contrast.

- As in GI, in GII the **voiced retroflex /D/** has consistently been substituted by /d/ as /Dəmrɪ/→/dəmrɪ/, /ənDa/→/ənda/ and /Thənd/→/thənd/. However, the subjects show familiarity with the test words.

Like GI, all members of GII substitute the **voiceless aspirate /Th/** by its alveolar counter part /th/ in all word positions as /Thənda/→/thənda/, /əThənni/→/əthənni/ and /aTh/→/ath/.

- For the **voiced Aspirate /Dh/**, the male child in the group doesn't respond to any of the test words which may not yet be there in the child's verbal repertoire.

Among the females, the only test word that has been recognized is /Dhəkkən/ which is pronounced as /dhəkkən/. Like GI, in GII also /DH/ gets substituted by /dh/. For the phoneme in the WM position, the test word taken was /buDDha/ which is not recognized by the group as the subjects don't seem to come across the word frequently in day to day life.

- The analysis shows that the retroflex ~ dental contrast has not yet appeared in the age group as all the retroflexes are constantly being substituted by dentals.

GROUP – III (GIII)

Group III consists of 4 subjects – 2 males and 2 females. The age of the group ranges from 3y. 2m.28 days to 3y.3m.20 days. The 2 male subjects are 3y2m.28days, 3y.3m. 20 days old and the females are of age 3y.3m. 12days and 3y.3m. 13 days respectively.

Speech sounds found in common between GI and GIII:

- **The vowels** acquired in GI appear with the same uniformity and clarity in GIII. All the four subjects in GIII show correct response to /i/, /I/, /e/, /a/, /o/, /U/, u', /ə/. The contrast of /i/~/I/, /v/,/u/ and /e/~/ε/ are also clear in the whole group.

- Among **consonants**, /p/,/b/,/t/,/d/,/c/,/j/,/z/,/h/,/l/,/m/,/n/,/y/ and /w/ are the common consonant phonemes which show correct responses in GI and GIII. The whole group– has acquired these sounds uniformly.

Speech sounds present in GI but variations in GIII:

- /ch/, /kh/, /r/, /R/ and /s/ are the consonant phonemes which had correct responses in GI but in GIII they don't occur uniformly throughout the group and appear with individual variations the members of the groups.

Description

- **The voiceless palatal affricate /ch/** appears clearly in the group except for one female child (3.3.12) who in spite of recognizing the test words correctly, substitutes/ ch/ by /s/ as, /chətri/→ /sətri/, /mächli/ → /məsli/ and /pūch/ → /pūs/.

Thus, 9 out of 12 responses are correct. The same substitution was noted in one of the subjects in GII earlier. The responses show that /ch/ appears in the group except for the variation in one of the members, which seems to be eclectic.

- **Voiceless velar aspirate /kh/** clearly appears in other members except for the same female child (3.3.12) who substitutes it by /th/, its dental counterpart as, /khira/ → /thira/, /mækkhən/ → /mætthən/ and /ākh/ → /āth/.

All other members of the group pronounce it correctly. The problem seems to be more with the phoneme than with the test words because although the female child substitutes the phoneme, at the same time she recognizes all the test words with much clarity.

9 out of 12 responses are correct and due to the reasons stated above, the variation could be eclectic as the same child substitutes /ch/ by /s/ and /kh/ by /th/. The same child also shows velar substitutes by dental-though not consistently, in case of /k/, /g/, /gh/, as well.

- **Trill /r/** has been clearly acquired by only one male child (3.3.20) in the group who is the youngest among all. One of the females (3.3.12) and another male (3.3.28) substitute /r/ by /R/ as /rel/→ /Rel/ , /gərəm/→ /gəRəm/ and /əŋgur/→ əŋguR/.The female of 3.3.12. substitutes /r/ by /l/ in all the word positions as /rel/→/lel/, /gərəm/ → /gələm/and /əŋgur/ → /əŋgul/

4 out of 12 responses are correct. With so much variations, /r/ doesn't show any systematic occurrence in GIII as compared to GI. We can conclude that /r/ is in the process of acquisition in the age group.

The youngest male child (3.2.28) in the group substitutes **flap /R/** with /l/. Elsewhere, in the other members of the group, /R/ appears clearly in all test words.

5 out of 8 responses are noted to be correct. It could be the age factor for the male child as he has just reached 3 yrs., that he is not yet able to acquire the proper sound /R/ otherwise, group III marks the acquisition of /R/.

Voiceless fricative/s/ appears clearly in the group except in one female child (3.3.12) where it is substituted by /ch/ as in /səntəra/ → /chəntra , /asman/ → /achman/ and /pyas/ → /pyach/

9 out of 12 responses are correct. The reason for the substitution noted in the female child seems to be eclectic as the child finds more difficulty with the phoneme rather than the test words.

New contrasts in GIII

Certain speech sounds that did not appear in GI, and are noted in this age group have been listed in this section. Although the group acquires the speech sounds, they are not distributed uniformly throughout the group. They still appear with individual variations.

/ph/,/bh/,/th/,/dh/,/jh/,/k/,/g/,/gh/,/t/,/th/ and /s/ are the consonant phonemes listed under this category.

Description:

- **Voiceless bilabial stop aspirate /ph/**, appears clearly in one female (3.3.13) in the group. It is substituted by /p/ in the other members of the group. All the group members recognize the test words correctly.

The substitutions are /phulgobhi/ → /pulgobi/ and /sitaphəl/ → /sitapəl/

2 out of 8 responses are correct. Vocabulary seems to be a constraint for the acquisition of /ph/.

- A large number of inconsistency is noted in the group in the acquisition of **Voiced bilabial stop aspirate /bh/**. One female child (3.3.12) and one male child (3.2.28) in the group substitute /bh/ by /b/ as in /bhalu/ → /balu/, /jibh/ → /jib and /gobhi/ → /gobi/.

Another female (3.3.13) substitutes /bh/ by /ph/ in the word initial position and by /b/ else where as /bhalu/ → /phalu/, /gobhi/ → /gobi/ and /jibh/ → /jib/.

Another male child (3.3.20) who is the eldest in the group has acquired /bh/ correctly in all the word positions. 3 out of 12 responses are correct.

Although /bh/ is a sound that didn't appear in GI and emerges in GII, the inconsistency in acquisition of the phoneme indicates that it is just beginning to appear in the group. The difficulty seems to be more in acquiring the phoneme rather than in recognizing the test words.

- **Voiceless dental stop aspirate /th/**: Only one female child (3.3.12) pronounces the consonant phoneme correctly in all word positions. In all the other members, /th/ is substituted by /t/ as /thali/ → /tali/, /hathi/ → /hati/ and /hath/ → /hat/.

3 out of 12 responses are correct where the correct response for /th/ seems to be eclectic. /th/ substitutes itself and is yet to be acquired by this age group.

- **Voiced dental stop aspirate /dh/** appears in three out of four members of the group. The male child who is the youngest among the four, substitutes /dh/ by dental stop /d/ as /dhəkka/ → /dəkka/, /adha/ → /ada/ and /dudh/ → /dud/.

9 out of 12 responses are correct. We assume that /dh/ appears in the group.

As all test words are recognized by all the subjects, the assumption could be, as the male child is the youngest in the group, /dh/ might not have appeared in his phonemic repertoire. Its unaspirated counterpart is still substituting it.

The reasons, thus seem to be eclectic.

- **Voiced palatal affricate aspirate /jh/** has been acquired clearly by the group except in one female child (3.3.13) who substitutes /jh/ by /ch/, its voiced counterpart, only in the WI position as /jhaRu/ → /chaRu/ and /jhənDa/ → /chənDa/.

The whole group recognizes the test words correctly.

6 out of 8 responses are correct. The responses for the WM and WF positions are not known, as the children do not respond to the test words.

/jh/ is beginning to appear in the group. The reason for its delay in acquisition could be the test words or the phoneme itself.

- The **voiceless velar /k/** is substituted by /t/ in a single female child in the group /k/ by /t/ in all the word positions and the same child substitutes /gh/ by /kh/ in the WI positions. The substitutions for /k/ are – /kela/ → /tela/, /bəkri/ → /bəttri/ and /ek/ → /et/. For /gh/, /ghəRi/ → /dhəRi/ and /ghər/ → /dhər/. The group does not recognize /bagh/, the test word. The substitution of /gh/ by /kh/, word initially in the female child could be due to the influence of Punjabi in

the child's speech. As no other member shows this substitution, again such a variation seems to be eclectic. 15 out of 24 responses are correct.

It can be assumed that /k/ and /gh/ have been acquired by the age group.

- **Retroflex /T/** clearly marks its appearance in the group except in the youngest age 3.2.28 who is a male.

He substitutes /T/ by /t/ in all word positions as /TəmaTər/→/təmatər/, /məTər/→/mätər/ and /ũT/→/üt/

9 out of 12 responses are correct.

As the child is the youngest subject in the group, the phoneme would not have appeared in his phonemic repertoire. The child is noted to have recognized the test words. The child's substitutions are eclectic. We assume that /T/ has already appeared in the age group.

- **Aspirated retroflex /Th/** is pronounced clearly by one female and one male (3.3.13, 3.3.20). The other male and female (3.3.28, 3.3.12) substitute it by /th/, its unaspirated counterpart in all word positions as /ThənDa/→ /thənda/, /əThənni/→ /əthənni/ and /aTh/→ /ath/.

6 out of 12 responses are correct. The assumption could be that it might be due to age factor that two subjects substituted /Th/ by /th/ as they are younger to the other two subjects. The problem seems to be more with the phoneme than with the lexical items.

- **Palatal fricative /š/** appears consistently in the entire group clarifying the /s/ ~ /š/ contrast except for a single female child (3.3.12) where /s/ gets substituted by /ch/. 6 out of 8 responses are correct.

The substitution of /s/ by /ch/ in a single subject could be idiosyncratic. However, /s/ appears in the group.

- /D/ and /Dh/ are the two phonemes which are completely substituted by their dental counterparts in all members of the group.

/D/→ /d/ (by all subjects) as /Dəmru/→ /dəmru/, /ənDa/→ /ənda/ and /ThənD/→ /thənd/

/D/ has not yet begun to appear in the group's phoneme repertoire.

/Dhəkkən/ → /dhəkkən/ and /buDDha/ → /buddha/

/dh/ is also yet to appear in the age group.

GROUP- IV (GIV)

Group IV consists of 6 subjects – 3 males and 3 females within the age limit of 3y 5m to 3y 6m 6days.

The male children are of the age 3y 5m, 3y 5m 29days and 3y 6m 4days. The female children are of 3y 6m 4days, 3y 6m 6days and 3y 6m 6days.

Speech sounds found in common between GI and GIV

- Among **the vowel** speech sounds, /i/, /I/, /e/, /ɛ/, /a/, /o/, /u/, /U/ and /ə/ occur consistently through out GIV which were present in the same manner in GI. The vowel contrasts are also well established. No substitutions or individual variations are noted in the acquisition of vowels.

Among the **consonant phonemes**, we list out /p/, /b/, /t/, /d/, /c/, /j/, /kh/, /s/, /z/, /h/ /l/, /m/, /n/, /y/ and /w/ which keep consistency in occurrence in both GI and GIV.

Correct responses in GI but Variations in GII

- This set of consonant phonemes include /ch/, /t/ and /R/.

Description

- **Voiceless aspirate /ch/** appears in the group except in two females where one of them (3.6.4) substitutes it by unaspirated affricate /c/ and the other one (3.6.6) substitutes it by /s/. The substitutions are as follows.

/chətri/→/cətri/, /mächli/→/mæcli/ and /pūch/→/pūc/ (by the female of 3.6.4)

/chətri/→/sətri/, /mächli/→/məsli/ and /pūch/→/pūs/ (by the female of 3.6.4)

12 out of 18 responses are correct. /ch/ has appeared in the group except eclectic variations in the responses of two of the members of the group.

- In one of the male children (3.5.29) and one of the female children (3.6.6) trill /r/ is substituted by /r/. It has been acquired correctly by other subjects of the group. 12 out of 18 responses are correct. Variations shown by the two members can be considered eclectic. /r/ appears in the age group.
- **/R/, the flap**, has been acquired by the group except by the male child (3.0.5) who substitutes /R/ by /r/, the trill. 10 out of 12 responses are correct. The single child who is the youngest in age shows the variation.

New contrasts in GIV

- /ph/, /th/, /k/, /g/ and /gh/ are the five speech sounds which were not acquired correctly by GI and have been acquired correctly by all the subjects in GIV with out any substitution or individual variations which were noted in earlier groups.
- Among other consonants are /bh/, /dh/, /t/, /d/, /th/ and /s/ that are acquired by children in GIV and were not noted in the speech of the child in GI, unlike the phonemes mentioned above.

Description:

- **Voiced aspirate /bh/** occurs correctly in 1 male child (3.5.29) and one female child (3.6.4). The other children in the group substitute in by /b/ in all the tested word positions recognizing all test words correctly. 6 out of 18 responses are correct. The response shows that /bh/ has just started emerging in the group. It is yet to be attained uniformly by the whole group.
- **Voiced aspirate /dh/** has been substituted by its voiced alveolar counterpart /d/ in the group except in one female (3.6.4) where it has been acquired clearly in all word positions. 3 out of 18 responses are correct for /dh/.

The correct responses for the phoneme in the single child seem to be due to much familiarity with the test words.

- **Voiceless retroflex /T/** emerges correctly in one child (3.6.4). All other subjects substitute it by its dental counterpart /t/. 3 out of 18 responses are correct. Only one child seems to have responded correctly to the phoneme. The rest of the five children substitute it by its dental counterpart.

The same male child acquires /D/ in all the three word positions, recognizing the test words correctly. All others in the group although recognize the test words, substitute the phoneme by its dental counterpart /d/. /D/ also gets 3 out of 18 responses correct.

The retroflex ~ dental contrast is just beginning to appear in the age group.

- The **voiceless retroflex aspirate /Th/** is articulated correctly by a single male child (3.6.4) in all the word positions.

/TH/ is substituted by /s/ in the youngest child of the group (male 3.5.0) in the WI and WM positions.

The reason for the variations in /Th/ cited above could be idiosyncratic.

All the other four subjects of the group substitute it by /th/.

3 out of 18 responses are correct. It shows that the group is just beginning to acquire /th/.

It appears correctly in the same male child who has the clear articulation of /T/ and /D/.

- **Palatal fricative /š/** appears in the whole group except in one female child (3.6.6) where it is substituted by the alveolar fricative /s/. 10 out of 12 responses are correct. /š/ appears in the group. The variation in a single child seems to be eclectic. The child finds more difficulty with the phoneme than with the test words.
- **Voiced aspirate /jh/** shows much clarity in acquisition except in one female (3.6.6) where it gets substituted by /j/, its unaspirated counterpart. 10 out of 12 responses for /jh/ are correct. However, the test word/sānjh/ could not be recognized by any of the subjects, as they don't find it in their regular use. The variation shown by one child seems to be eclectic.
- **The voiced aspirated retroflex /Dh/** is substituted by /dh/ in 2 males (3.5 and 3.5.29) and 2 females (3.6.4 and 3.6.6). The rest of the two subjects (one male-3.6.4 and one female-3.6.6)

No correct response is noted for /Dh/. We assume that /Dh/ has not begun to appear in this age group. The /d/~ /Dh/ and the /dh/~ /Dh/ contrast is yet to appear.

GROUP-V (GV)

Like GI, GV also consists of a single child. The subject in GV is a female child, 3y7m28 days old. The child shows the following phonological pattern-

Speech sounds found in common between GI and GV

- **Vowel phonemes** /i/, /ɪ/, /e/, /ɛ/, /o/, /ʊ/, /u/ and /ə/ are the sounds that are clearly articulated by the subject in GV. The phonemes showed the similar pattern of acquisition in GI. The child also produces the long and short vowel contrasts correctly.
- The **consonant phonemes** that are acquired clearly in GV and GI are /p/, b/, /t/, /d/, /c/, /j/, /kh/, /R/, /s/, /z/, /h/, /l/, /m/, n/, /y/ and /w/. The child gives correct responses to all the test words used for testing these phonemes.

Correct responses in GI but variations in GV

- /ch/ and /r/ are the two phonemes which were acquired clearly by GI, and appear in GV in substitution.
- The **voiceless aspirated affricate /ch/** is substituted by its unaspirated counterpart by the child as /chətri/→/cətri/, /mächli/→/mæcli/, /pūch/→/pūc/.

The child is yet to acquire the correct pronunciation of /ch/.

- The **trill /r/** has been substituted by /R/, the flap by the child in all the three word positions as /rel/→/Rel/, /gərəm/→/gəRəm/, /əŋgur/→/əŋguR/.

/r/ is yet to be acquired by the child.

New contrasts in GV

- /ph/, /dh/, /k/, /g/ and /gh/ are the consonant phonemes which are acquired clearly and correctly by the child.

No substitutions or variations are noted for the above speech sounds.

- /bh/, /th/, /jh/, /T/, /D/, /Th/ and /Dh/ are the consonant phonemes that show substitutions in the child's articulation.

- In the test words mentioned earlier, **voiced stop aspirated /bh/** is substituted by its unaspirated counterpart /b/.
- **Voiceless dental aspirate /th/** is substituted by /t/ by the child.

The /bh/~b/ and /th/~t/ contrasts have not yet appeared in child.

- **Voiced aspirated affricate /jh/** is substituted by its unaspirated counterpart /j/.
- **Voiceless retroflex /T/** is substituted by /t/.
- **Voiced retroflex /D/** is substituted by /d/.
- Likewise, **/Th/** gets substituted by its dental counter part /th/ and **/Dh/** gets substituted by /dh/.

The retroflex ~ dental contrast has not appeared in the child of this age.

As the child responds to the test words and recognizes them correctly, the reason for substitution could be that the child is yet to acquire these speech sounds and make a clear distinction between their substituting counterparts.

GROUP-VI (GVI)

Group VI consists of 2 female children who are 3y 10m 3days and 3y 11m 3 days old.

The phonemic pattern they show is as follows-

Speech sounds found in common between GI and GVI:

- All **vowel phonemes** acquired by GI i.e. /i/, /I/, /e/, /ε/, /a/, /o/, /U/, /u/ and /ə/ are also correctly acquired by GVI.
- /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /kh/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ among the **consonant phonemes** are commonly acquired by both GI and GVI.

The test words are also clearly recognized by both the children in the group.

Correct responses in GI but variations in GVI:

No such phoneme is noted in GVI.

New Contrasts in GVI

- /th/, /jh/, /k/, /g/, /gh/, /T/ ,/D/ and /š/ are the phonemes that are not noted in GI and are responded clearly and correctly by both the members of GVI. No variations or substitutions are noted for any of these phonemes. The subjects also respond to the test words correctly.
- /ph/, /bh/, /dh/, /Th/ and /Dh/ are the phonemes which appear with substitutions and individual variations in the group.
- **Bilabial stop aspirate /ph/** is substituted by one of the females in the group (3.10.3) as she substitutes /ph/ by /f/ in the tested word positions as/phul/→/ful/ and /sitaphəl/→/sitafəl/

The reason for the substitution of bilabial aspirate /ph/by labio-dental fricative /f/ could be the dominance of English. By this age the child seems to have been exposed to English language, which dominates while pronouncing this phoneme. /ph/ is superimposed by /f/.

The other child has acquired /ph/ correctly along with the correct recognition of the test words. 2 out of 4 responses are correct. Since the group has only two members and each of them share 50% of the responses, it is hard to decide whether /ph/ has been acquired by the group or not. As /ph/ appears in the articulation of a single member, we can assume that /ph/ is beginning to appear in the group.

- Although the test words are recognized correctly, the **bilabial voiced stop aspirate /bh/** is constantly being substituted by /b/ by both the children. We assume that /bh/ has not yet begun to appear in the age group.

- One of the females (3.11.3) substitutes the **dental stop aspirate /dh/** by /d/.
- The other child pronounces the sound correctly. /dh/ acquisition has the similar pattern as that of /ph/. We can thus assume that /dh/ has just started appearing in the age group.
- One female child (3.10.3) in the group substitutes **aspirated retroflex /Th/** by /th/.
- The other child (3.11.3) pronounces it correctly. All the 6 test words are identified correctly by the child 3 out of the total 6 responses are correct.
- We assume that /Th/ is just beginning to appear in thus age group.
- One of the female subjects (3.10.3) who is the younger one, substitutes /Dh/ by /dh/. The other child responses correctly to the phoneme. Both the subjects identified the test words /Dhækkən/ and /buDDha/ correctly.
- 2 out of 4 responses are correct. We assume that /Dh/ is just beginning to appear in the age group.

GROUP– VII (G VII)

G VII consists of five subjects – 2 male children (4.1.18 and 4.2.2) and 3 female children (4.1.25, 4.2.24 and 4.3.9).

Speech sounds found in Common b/w GI and G VII:

- G VII correctly acquires all the vowel phonemes acquired by GI. i.e. /i/, /I/, /e/, /ɛ/, /a/, /o/, /U/, /u/ and /ə/.
- Among the consonants /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are found in common and have already been acquired by both GI and GVII. All the subjects recognize all the test words corresponding to the phonemes correctly.

Correct responses in GI but variations in GVII:

- /kh/ is the only phoneme noted under this category. One of the female children (4.3.9) substitutes /kh/ by /k/ in the WI position as

/khərgoš/ → /kərgoš/

The child responds correctly to the phoneme in the WM and WF positions. The reason seems to be idiosyncratic as /kh/ appears in the child's phonemic repertoire in other word positions.

All other subjects have acquired /kh/ correctly. 14 out of 15 responses are correct.

New Contrasts in GVII

- /bh/, /th/, /k/, /g/, /gh/ and /š/ are the speech sounds which are correctly acquired by the whole age group without any substitutions or variations. The subjects have responded correctly to all test words.

New contrasts found in GVII

- /ph/, /dh/, /jh/, /T/, /D/, /Th/, /Dh/ are the phonemes which appear with individual substitutions in the groups.
- All the 3 female children (4.1.25, 4.2.24 and 4.3.9) substitute /ph/ by /f/.

The two male children have acquired the sound correctly.

5 out of 10 responses are correct. We assume that the substitution of /ph/ by /f/ is dominant primarily in the responses of female subjects.

- Two females (4.1.25 and 4.2.24) substitute the phoneme /dh/ by /d/ in the entire three test word positions, as /dhəkka/ → /dəkka/, /adha/ → /ada/ and /dudh/ → /dud/.

Both the females identify the test words correctly. So, the problem seems to be more with the phoneme rather than with the test words. The rest of the 3 subjects have acquired /dh/ correctly along with all the test words.

9 out of 15 responses are correct. We assume that /dh/ appears in the age group.

- One male child (4.1.18) substitutes /jh/ by /j/ in test words /jhaRu/ and /mənjhla/.

The responses are /jaRu/ and /mənjlə/. All other subjects pronounce the phoneme correctly in the tested word positions. 8 out of 10 responses are correct for the phoneme /jh/. Thus, it can be clearly noted that /jh/ appears correctly in the group except in one subject. The reason for the substitution could be eclectic.

- /T/ has been acquired correctly by the age group except in one male child (4.2.2) who substitutes /T/ by /t/ as /TəmaTəɾ/→/təmatəɾ/, /məTəɾ/→/mətəɾ/ and /ũT/→/ũt/.

All the subjects recognize the lexical items correctly. 12 out of 15 responses are correct. So, we presume that the age group has already acquired /T/ and the individual substitution noted is considered eclectic.

- One male child (4.2.2.) and one female child (4.1.25) substitute /D/ by /d/ in all the word positions as /Dəmrɯ/→/dəmrɯ/, /jhənDa/→/jhənda/ and /ThənD/→/thənd/.

All the subjects recognize the test words correctly.

9 out of 15 responses are correct. We assume that /D/ appears in the group as 3 out of 5 subjects respond correctly to /D/.

- Both the males (4.1.18) and (4.2.2) and two females (4.1.25 rd 4.2.24) substitute /Th/ by /th/ in all word positions. Only one female child (4.3.9) who is the eldest among the subjects pronounces it correctly.

3 out of 15 responses are correct. We assume that /Th/ is just beginning to appear in the age group.

- 2 males (4.1.18 and 4.2.2.) and one female child (4.1.25) substitute /DH/ by /dh/. All the subjects recognize the test words correctly.
/Dhəkkən/→/dhəkkən/ /buDDha/→/buddha/.

5 out of responses are correct: /Dh/ appears correctly in two females (4.2.24 and 4.3.9) who are older in the age group. We assume that /Dh/ is beginning to appear in the members of this age group.

GROUP – VIII (G VIII)

Group VIII consists of two subjects, one male child who is 4y 4m old and one female child who is 4y 5m 9 days old.

Speech sounds found in common between GI and GVIII:

- All the **vowel sounds** (/i/, /I/, /e/, /ɛ/, /a/, /o/, /U/, /u/ and /ə/) those were acquired by GI are also acquired correctly by both the subjects of GVIII with all vowel contrasts finely established.
- Among the **consonant speech sounds**, /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /kh/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ have been acquired clearly and correctly by both the groups.

Correct responses in GI but variations in GVIII:

- No such speech sound is noted.

New Contrasts in GVIII:

- /th/, /dh/, /k/, /g/ and /š/ are the speech sounds which show clear articulation in both the members of the age group as they respond correctly to the phonemes and to the test words as well.

- /ph/, /bh/, /gh/, /T/, /D/, /Th/ and /Dh/ are the noted phonemes which show individual variations in the age group.
- Both members of the group substitute /**ph**/ by /f/. The dominance of English labio-dental phoneme becomes consistent over the age group.
- The female child (4.5.9) in the group substitutes /**bh**/ by /p/ with a falling tone in the following vowel in WI position which marks the influence of Punjabi on the child's speech. The child recognizes all the test words correctly as she substitutes /bhalu/→/pàlu/.

/bh/ remains /bh/ in all other word positions. The male child pronounces /bh/ as /bh/. No substitutions are found in his speech.

- The female child substitutes /**jh**/ by /c/ with a falling tone in the following vowel word initially which again marks the influence of Punjabi in the child's language.

The substitutions are /jhula/→/cùla/, /jhaRu/→/càRu/.

The other child doesn't make any substitution in /Jh/.

- /**gh**/ is substituted by /k/ with a falling tone in the following vowel by the female child word initially as /ghər/→/kər/.

As seen previously, the same child substitutes /bh/ by /p/ and /jh/ by /c/ in the WI position. The child interestingly marks the emergence of the Punjabi consonant phonemes which are acquired in words that are cognates in Punjabi.

- All the four retroflex phonemes /**T**/, /**Th**/, / **D**/ and / **Dh**/ are correctly acquired by the female child where as the male child substitutes them by their dental counterparts. We assume that the retroflexes are beginning to appear in the age group and they already appear in the elder child.

GROUP– IX (G IX)

GIX consists of a single male child who is 4y 7m old. The phonemic pattern shown by the child is as follows.

Speech sounds found common between GI and GIX:

- All the tested vowels and consonant speech sounds, /i/, /I/, /e/, /ε/, /a/, /o/, /U/, /u/ and /ə/ among the vowel sounds and /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ among the consonant sounds are acquired correctly by GI and GIX. The phonemic contrasts among these speech sounds are also clearly noted in both the groups.

Correct responses in GI but variations in GIX:

- No such variations were noted in any of the common speech sounds between GI and G IX.

New Contrasts in GIX:

- The child in GIX shows correct articulation of the phonemes /th/, /jh/, /k/, /g/, /gh/, /š/, /T/, /Th/, /D/ and /Dh/ without any substitutions in any of the tested word positions.

The child also recognizes all the test words correctly.

Contrasts found in GIX:

A single phoneme /ph/ still gets substituted by labio-dental /f/. The /ph//f/ substitution is common even in the adult speech due to a combined influence of Perso-Arabic and English loan words where /f/ is a distinct phoneme.

GROUP- X (G X)

In Group X there are 4 subjects – 3 males and 1 female. The males children are 4.9.12., 4.11.9., 4.11.14. years old and the female child is 4.10.5 years old.

- The age group shows consistency in all the phonemes except for the voiceless aspirated stop /ph/, which is constantly being replaced by /f/. All other vowel and consonant speech sounds as the **stops, affricates, fricatives, retroflexes, trills, flaps, laterals, nasals and approximants** are articulated correctly in all the members of the group without any individual variations or substitutions.
- The /ph//f/ substitution is now more prominent in the group. It is almost like free variations.

SUMMARY AND CONCLUSION

Paedolinguistics, otherwise known as **Child Language Research**, has become a distinct component of Psycholinguistics since 1924. It owes its origin and nomenclature to William Stern who recognized it as an interdisciplinary field of research that primarily focused on the various aspects of the speech and language development in children. The origin and development of language in human child has been studied and being studied by scholars till date from different perspectives. Beginning with B.F. Skinner's *Verbal Behaviour* in the 50s to Chomsky's Cognitive Hypothesis that human being is equipped with an innate language learning capacity which is unique to the human species, leading to the queries that still remain unanswered, viz. how is the knowledge of language acquired by humans and how does this knowledge evolve in the human species, and are of prime concern in the emerging field of Bilingualism since the mid-seventies, this chronological development in the theoretical front has been discussed in the introductory chapter (Chapter 1) of the thesis.

The chronology of events in the practice of CLR and related empirical studies pursued in the same has been discussed in the second chapter on background studies and literature review. A brief overview on the chronology of CLR studies reveals that it dates back to the late 1896 when diary studies were in vogue. Their parents studied children personally by keeping a diary record of their everyday language development. The eminent diary studies done by Taine (1876), Prayer (1889), Stern (1924) and Leopold (1939) are worth mentioning. The post World War I era witnessed a shift from diary studies to large sample studies. Instead of studying a single child at one time, this method enabled the researchers to select a large number of children from distinct age groups. It also marked the beginning of the cross-sectional technique in empirical research. Along with the works of Smith (1926), Mc Carthy (1930) and Davis (1937), another marked feature of this era was the 'theory of phonological development' proposed by Jakobson as he explained the order of acquisition of phonemes added with a good deal of acoustic information.

The same chapter also includes a section on monolingual and bilingual child language researches done earlier. The earlier studies on child language

acquisition have focused on monolingual children. Among them are the studies conducted by Anderson and Smith (1967), Srivastava (1974) and Pye and Ingram (1987). In the later period studies in bilingual contexts emerged where the child is exposed to two languages simultaneously or consecutively. The present research is a case study in the Indian multilingual set up where the subjects are Hindi-Punjabi bilingual children born and brought up in a two-language environment. Hindi and Punjabi are both acquired as L1 by these children.

The third chapter is devoted to the methodological perspective and procedural steps followed in the present study. The study is based on the cross-sectional technique as the age of the subjects is between 3 to 5. A set of 30 children was studied for the present research work. All of them belonged to Hindi-Punjabi bilingual families in Delhi where they were exposed to both the languages since birth. The exact age of the subjects ranged from 2yrs11m to 4yrs11m14days. Age and gender were two variables taken into account. The test included 41 phonemes tested in the WI, WM and WF positions in 114 test words. The test and the selection of the words for the test have been given in detail in section 3.3 of chapter III. The validity of the test was tested by pre-testing two children of around 5 years of age. (see details in section 3.4 of chapter III) The words and the sounds, which even the 5 yrs old could not recognize, were reviewed. Some words were replaced and few sounds were sampled out of the test. (see details in section 3.4 of chapter III).

The age wise grouping of the thirty test subjects was in fact tedious. It was not possible to classify and group them into 8 or 9 3months regular slots as normally expected, simply because we did not have the same number of subjects in every 8 months slot. The grouping was also not based on their performance or responses and it had to be done on the basis of the age gap between the subjects. The closest in age were put together. So, we have 10 groups in all, GI, GV, and GIX having only one child each. The single child groups serve as reference points – especially the child in GI who is the youngest in age (less than 3yrs), vocal enough such that his repertoire of speech sounds could easily serve as the starting point.

The analysis of the data presented in Chapter IV has been summed up here.

GI

1. The child in GI shows correct articulation of vowel speech sounds /i/, /I/, /e/, /a/, /o/, /U/, /u/, and /ə/. The response sheet shows that out of 21 test words, the child responds to 20 words correctly for the above speech sounds. /okhli/, the test word where /o/ lies in the WI position, as the child does not seem familiar with the lexical item. However, the number of correct responses shows that these vowel sounds have appeared in the child's phonemic repertoire by the age of 2.11 or may be before that although it is difficult to know the order of acquisition of these phonemes.
2. The responses show clear contrast between vowel phonemes /i/~I/, /U/~u/.
3. Vowel phoneme /ε/ appears only in one test word /hε/ as the child fails to recognize the other two words /εnək/, and /pεse /. 1 out of 3 responses are correct for /ε/. However, in spite of the vocabulary constraints /ε/ is beginning to appear in the child.
4. /p/, /b/, /t/, /d/, /c/, /ch/, /kh/, /n/, /m/, /r/, /R/, /l/, and /s/ among the consonant phonemes have been correctly acquired by the child with the /p/~b/, /t/~d/, /c/~ch/, /r/~R/ contrasts clearly established. The child identified all the 37 test words.
5. Phonemes /ph/, /jh/ and /š/ don't get any responses in any of the word positions as the child does not respond to any of the test words. Due to vocabulary constraints, acquisition of these three phonemes is not clear in the child.
6. Voiceless aspirated stop /th/ is substituted by its unaspirated counterpart /t/.
7. Voiced aspirated stops /bh/ and /dh/ are also substituted by their unaspirated counterparts /b/ and /d/ respectively. The aspirated ~ unaspirated contrast does not appear in the child by this age.
8. The velars /k/, /g/, and /gh/ get substituted by /t/, /d/, and /d/ respectively. Surprisingly, the child has clearly acquired /kh/ which could be explained as

an eclectic variation. The velar ~ dental contrast is not yet established in the child. As discussed in the previous point, as the child substitutes /dh/ by /d/, for /gh/ also he uses /d/ instead of /dh/. We assume that the velars are just beginning to appear in the child.

9. Retroflexes /T/, /D/, /Th/ are substituted by their dental counterparts /t/, /d/, and /th/. The child identifies the lexical items clearly except for /Dəmru/ where /D/ appears in the WI position. Retroflexes have not yet appeared in the child's phonemic repertoire. Vocabulary seems to be the other constraint.
10. /h/, /z/, /y/, and /w/ are the phonemes which get one response each out of three words tested for each phoneme. Vocabulary seems to be a constraint, as the child responds only to the test words, which are very common in everyday use. This casts doubts about the child having acquired and established these phonemes.

GI and GII

The following points summarize the discussion on GI and GII

1. Like GI, GII has also correctly acquired vowel phonemes /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/, /ə/, and /d/. 24 out of 24 responses are correct for all the test words. The /i~/I/, /e~/ε/ and /u~/U/ contrasts are clearly established in the age group.
2. /p/, /b/, /t/, /d/, /j/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/, and /w/ have clearly been acquired by both GI and GII. All the 41 responses by both the groups are correct.
3. /c/, /ch/, /kh/ and /r/ are the consonant phonemes occurring clearly in GI but show variations in GII. Eclectic variations are noted as the single male child in the group (3.0.4) substitutes /c/ by /s/ word finally, the same child also substitutes all velars /k/, /kh/, /g/ and /gh/ by their dental counterparts. The other 3 members who are females have acquired /c/, /k/, /kh/, /g/, /gh/ correctly.

4. But it seems difficult to derive any general conclusion, which would account for any distinct acquisition pattern in male and female subjects, as there is no such uniformity found in the acquisition or substitution of any of the speech sounds in the group. /ch/ is substituted by /s/ by one female member (3.1.4) which could be due to the influence of Punjabi, /r/ substituted by /R/ by two female members. (3.0.19 and 3.1.4) and by /l/ in another female (3.1.1)
5. Collectively among the 4 members of group II and of 12 responses are correct for /c/, 9 and 12 responses are correct for /ch/, 12 out of 16 responses are correct for /kh/ and 6 out of 12 responses are correct for /r/. We can conclude that inspite of eclectic variations, /c/, /ch/, /kh/ and /r/ have been acquired by the group.
6. Stop aspirates /ph/, /bh/,/th/ and /dh/ are the sounds which are substituted by their un-aspirated counterparts in the group. It is noted that /ph/→/p/, /bh/→/b/,/th/→/t/ and /dh/→/d/ consistently by some members of the group.
7. Voiced aspirate affricate /jh/ is beginning to appear in the group as the female subjects respond only to one test word in the WI position and the male subject responds to none.3 out of 16 responses are correct.
8. Among the retroflexes /T/,/Th/,/D/ and /Dh/,/T/ acquisition is in the process by all the members as the description on /T/ earlier. The retroflexes show too many eclectic variations by the members of the group in different word positions. Only one female subject has acquired the sound correctly. It seems, the children in this age group (all male and females) are in the process of acquiring the /t~/T/ contrast. Other retroflexes /th/,/d/and /dh/ are uniformly substituted by their dental counterparts where the subjects have responded to the test words.
9. Palatal fricative /š/ occurs in the group except in the male child for which the reason would be eclectic as he substitutes /š/ by /ch/ in one test word and he doesn't respond to the other test words. 6 out of 8 responses are correct for the phoneme. All the female subjects respond correctly to /š/. The /s~/š/ contrast has been acquired by the female subjects of this age group.

10. Among the 4 subjects in the group, the male child shows the maximum number of substitutions who is younger than the other three subjects (all females). The male child substitutes velars by dentals, aspirates by unaspirates, retroflexes by dentals and palatal fricative by palatal affricate. Maximum number of no responses is also noted in the male child. It could be explained through the age factor. As the male child is the youngest among the group and is just 3 yrs old, many of the substituted speech sounds or words that do not get any response are probably in the process of acquisition in the age group.

GI and GIII

A summary of the description on GI and GIII is as follows:

1. Vowel phonemes /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/ and /ə/ are acquired correctly by both the groups. Both GI and GIII have responded all the 24 test words correctly.
2. Speech sounds /p/, /b/, /t/, /d/, /c/, /j/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are acquired correctly by GIII. This group just like GI finds all the 39 responses correct.
3. /ch/, /kh/, /r/, /r/ and /s/ are the speech sounds which are consistent in G I and show individual variations in the 4 members of G III. Eclectic substitutions are noted in case of /ch/, /kh/, /r/ and /s/ as one of the female subjects (3.3.12) substitutes /ch/ by /s/ which could be explained as the influence of the other 4 Punjabi on Hindi. 9 out of 12 responses are correct for /ch/. The same child also substitutes /kh/ by /th/, /r/ by /R/ and /s/ by /ch/. 9 out of 12 responses are correct for /kh/, the same number of responses are correct for /ch/ as well. The same child as we see in the discussion earlier has also substituted all other velars /k/, /g/ and /gh/ by their respective dental substitutes. /r/ become /R/ by another female (3.3.25) and becomes /l/ by another female (3.3.13). 3 out of 12 responses are correct for /r/.
4. The acquisition of /r/ is in the process acquisition by all the members of the group. /r/ as a distinct phoneme is yet to be established.

5. The male child substitutes /r/ by /l/ whereas clearly acquires /r/ and /l/ as distinct phonemes. The /r/, /l/ and /r/ distinctions are yet to be established clearly by the age group.
5. 2 out of 8 responses for /ph/ and 3 out of 12 responses for /bh/ are correct in the group. It seems /ph/ and /bh/ are just beginning to appear at this age.
6. Dental stop aspirates /th/ and /dh/ show an inconsistent pattern of acquisition in the group. /th/ gets only 3 correct responses out of 12 test words. The correct response by a single female child (3.3.12) could be eclectic in nature. The group is in the process of correct acquisition of /th/.
7. /dh/ appears correctly in 9 responses out of 12. The youngest male child doesn't acquire the sound and substitutes it by /d/. Moreover, the responses show that the group is still in the process of acquiring the sounds correctly and uniformly.
8. /jh/ is emerging in the group. But as one of the subjects the female child (3.3.13) substitutes it by /ch/ and secondly the WM and WF words are not responded by any of the subjects, we assume that /jh/ appears in the group but its acquisition could be better tested taking new test words into account.
9. Aspirates are emerging at this point of time. Voiced aspirates sharing substitutions with voiceless unaspirated stop by one child could be explained as the influence of cognate language Punjabi.
10. Among the retroflexes /T/ is substituted by /t/ by the youngest subject (male, 3.2.28) of the group. It has been acquired clearly by other subjects. The Eclectic variation of /t/ for /T/ could be due to the child being the youngest in age in the group.
11. /Th/ has got fifty percent of correct responses and fifty percent of substitutions. The male subject (3.2.28) and one female child (3.3.12) substitute /Th/ by /th/. We assume that /th/ is beginning to stabilize in the group.

12. Retroflexes /D/ and /Dh/ have not yet appeared in any of the subjects of the age group and are still substituted by their dental counter parts.
13. The group shows clear contrast between /s/ and /š/ except in one female child (3.3.12) who substitutes it by /ch/ in all the responses. 9 out of 12 responses are correct. The /s/~š/ contrast is yet to be acquired correctly by the age group. The eclectic choice of /ch/ for /š/ could be due to the bilingual influence on the child's speech.

GI and GIV

To summarize the discussion on G I and G IV:

1. Subjects of GI and GIV have rightly acquired the vowel speech sounds /i/, /I/, /e/, /ɛ/, /a/, /o/, /u/, /U/ and /ə/. All the 24 responses are correct.
2. Among the consonant sounds /p/, /b/, /t/, /d/, /c/, /j/, /kh/, /s/, /z/, /h/, /l/, /n/, /m/, /y/ and /w/ have been acquired correctly by both the groups with further clarity in the articulations of /p/ ~ /b/, /t/ ~ /d/, /c/ ~ /j/, /s/ ~ /z/ contrasts.
3. /ch/, /r/ and /R/ are the speech sounds which show variation in G IV and have been acquired correctly by G I. /ch/ appears in the group with variations. /ch/ is substituted by /c/ by the female child (3.6.2) and by /s/ by other two female subjects (3.6.4) and (3.6.6) respectively. The variations are eclectic and the acquisition of /ch/ is yet to be correctly established in the group. /R/ also shows eclectic variation alternating with /r/ by the youngest male child.
4. Surprisingly, for the first time among the groups discussed earlier, GIV shows correct acquisition of /ph/ in all test words by all its 6 members without any substitutions or variations. Among other sounds /th/, /k/, /g/ and /gh/ are the ones who have been acquired correctly and uniformly by the whole group.
5. Consonant phoneme /bh/ has just started emerging in the group as one child (female 3.6.4) and one male (3.5.29) respond to it correctly. 6 out of 18 responses are correct. All other subjects substitute it by /d/.
6. /dh/ is beginning to appear in the group as only 3 out of 18 responses are correct. /dh/ still gets substituted by /d/.

7. Retroflexes /T/, /Th/, /D/ and /Dh/ are yet to be acquired correctly by the whole group. The male child (3.6.4) has acquired /T/ and /D/ and /Th/ correctly. All the other 4 subjects substitute it by /t/ and /d/ respectively. 3 out of 18 responses each are correct. /T/ and /D/ are just beginning to appear in the group. Retroflexes /Th/ has got 2 variations – /th/ and /s/. The choice of /s/ to be replaced in the place of /Th/ by a single male child is idiosyncratic. 4 subjects replace /Th/ by /th/ in all word positions.
8. /Dh/ has 2 substitutions – /dh/ and /d/. No correct response is found for /Dh/. We conclude that the dental substitution of retroflexes is still dominating this age group. The contrast is yet to be established.

GI and GV

1. Speech sounds /i/, /I/, /e/, /ε/, /a/, /o/, /U/, /u/ and /ə/ have been acquired in the same pattern and clarity in GI and GV. The /i~/I/, /e~/ε/ and /U~/u/ contrasts are clear in both the groups. All the 24 responses are correct.
2. Consonant phonemes /p/, /b/, /t/, /d/, /c/, /j/, /kh/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/, and /w/ have been acquired clearly by both the groups. The single child in GV responds correctly to all the phonemes. All 46 responses are correct.
3. For phonemes /ch/ and /r/, the subject in GV shows variation whereas GI has acquired them correctly. /ch/ is substituted by /c/. The /r~/R/ contrast is also yet to be acquired correctly as the child substitutes /r/ by /R/ in the test words.
4. Responses to all test words for /ph/ are correct. No substitution is noted by /f/ or /p/ for /ph/ in any of the responses.
5. Responses to test words for all velars /k/, /g/ and /gh/ are also correct. The velar or dental contrasts have been clearly established in the child's phonemic repertoire.
6. Among the dental aspirates, /dh/ has been acquired correctly along with the /d~/dh/ contrast established. /th/ is still substituted by its unaspirated counterpart /t/. The aspirated ~ unaspirated contrast in the phoneme is yet to appear

in the child. Likewise the /j/~jh/ contrast is not yet established. /jh/ gets substituted by /j/ in the child.

7. All the retroflexes /T/, /Th/, /D/ and /Dh/ still get substituted by their dental counterparts. The retroflex ~ dental contrast has not yet established in the GV child.

GI and GVI

To sum up the discussion on GI and GVI, the following points are of special significance:

1. Vowel sounds /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/ and /ə/ that have been acquired correctly by GI, show the same pattern of acquisition in GII. All the 24 responses are correct in GI and GVI.
2. /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /kh/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are the consonant sounds acquired correctly by the group. All the 53 responses are correct in both the groups.
3. No such phoneme is noted which has correct responses in GI and not in GVI. Both the female children in GVI show consistency in their responses to /th/, /jh/, /k/, /j/, /gh/, /t/, /d/ and /š/.
4. /ph/ is substituted by /f/ in one of the children's (3.10.3) speech. /bh/ is substituted by /b/ in the group. The aspirated ~ unaspirated bilabial stop contrast has not yet appeared in any of the members of the group. /dh/ is sharing substitution by /d/ in one female (3.11.3). The reason could be eclectic. All other dental stops and the respective aspirated~unaspirated contrasts have appeared clearly in both the members of the group.
5. The /T/~D/ retroflex contrast is clear but the /T/~Th/ and /D/~Dh/ contrasts are yet to appear in the group as group members show eclectic variations in /Th/ and /Dh/ by substituting them by /th/ and /dh/ respectively in all tested word positions.

GI and GVII

1. All vowel sounds /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/ and /ə/ are acquired correctly by both GI and GVII. All the 24 responses are correct.
2. /P/, /b/, /t/, /d/, /c/, /ch/, /j/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are acquired correctly by both GI and GVII.
3. /kh/ is the only sound found to be correctly acquired by GI and is substituted by /k/ in one of the female subjects' (4.3.9) response in the WI position. The reason for the substitution seems to be idiosyncratic. All other subjects pronounce /kh/ correctly in all three word positions.
4. The /b~/bh/ contrast is clear as /bh/ is acquired correctly by the group without any individual variations.
5. The aspirated~unaspirated contrast for /t/ and /th/ are clear as acquisition of /th/ gains clarity in the group.
6. The velars /k/, /g/ and /gh/ are acquired correctly with /k~/g/ and /g~/gh/ clear contrast. The /k~/kh/ contrast is not clear as /kh/ still shows variation/substitution by /k/.
7. The /s/ ~ /š/ contrast appears in the group with the correct articulation of /š/.
8. /dh/ is yet to be acquired by the whole group as two of the subjects (females-41.25 and 4.2.24) substitute it by /d/, its unaspirated counterpart. No subject seems to use /t/ as a substitution for /dh/ which could be due to the influence of the Punjabi cognate.
9. One male child (4.1.18) substitutes /jh/ by /j/. All other subjects have acquired the phoneme correctly. The /j~/jh/ contrast has not been acquired clearly by the age group.
10. The retroflexes are beginning to show clarity in articulation. 12 out of 15 responses are correct for /T/, 9 out of 15 responses are correct for /D/, 6 out of 10 responses are correct for /Dh/ and 3 out of 15 responses are correct for /Th/. The responses for /Th/ show that it is the only retroflex which is still not articulated properly.

GI and GVIII

1. All vowel sounds /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/ and /ə/ are correctly acquired by both GI and GVIII. All the 24 responses are correct.
2. /P/, /b/, /t/, /d/, /c/, /ch/, /j/, /kh/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are the consonant phonemes which show clarity in articulation by both the groups.
3. No such sound is found which has variation in GVIII and correct responses in GI.
4. /th/and /dh/ along with the /t~/th/, and /d~/dh/ contrasts are established in the age group. Responses are all correct for /t/, /th/, /d/, /dh/.
5. Among the stops, substitution of /ph/ by /f/ is getting prominent in the group.
6. The /ph~/f/ contrast is not differentiated anymore rather they are treated as two phonemes in free variation.
7. /bh/ is substituted by /p/ by the female (4.5.9), in the word initial position which is purely due the eclectic choice of the Punjabi cognate in the child's speech. /the male child acquires /bh/ correctly. The same female subject substitutes /jh/ by /c/ and /gh/ by /k/ in the WI positions. The vowels following /p/, /c/ and /k/ have a falling tone which is typical to the Punjabi language. These substitutions are significant from the point of view of the bilingual influence on the child's speech.
8. The retroflexes are substituted by the dentals in the male child, where as the female child pronounces them clearly. The substitution could be due to the younger age of the male child as retroflexes have not yet appeared in the age of the male child.

GI and GIX

1. All the vowel sounds – /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/, /ə/ are acquired correctly by the child in GIX as in GI. All the 24 responses are correctly articulated by the subject.

2. The consonant phonemes /p/, /b/, /t/, /d/, /c/, /ch/, /j/, /kh/, /r/, /R/, /s/, /z/, /h/, /l/, /m/, /n/, /y/ and /w/ are acquired by GI and are consistently present in GIX.
3. No such phoneme is noted which appears in GI and doesn't appear in GIX.
4. The /p~/b/ and the /b~/bh/ contrasts have clearly been established except for the /p/ or /ph/ contrast as /ph/ substitution by /f/ is consistent in the child for both the test words.
5. /ph/ substitution by /f/ is commonly marked even on the adult speech in Delhi in the Hindi/Punjabi bilinguals. Due to the influence of a large number of Perso/Arabic loan words like /saf/, /sirf/, /fəsəl/, /fəsəla/ as well as the excessive use of English words like fan, surf, fish and many more such words, /f/ has now become a part of the phonemic inventory of Hindi or Punjabi bilinguals but what has happened to the original phoneme /ph/ of the two languages due to this borrowing is interesting. /ph/ and /f/ are almost like two sounds in free variations.
6. The aspirated ~ unaspirated contrasts in /t~/d/, /t~/th/ and /d~/dh/ are clearly articulated by the child.
7. All the velars are also articulated correctly along with the voiced ~ voiceless and aspirated ~ unaspirated contrasts.
8. The acquisition of affricates and the respective contrasts in /c~/ch/ and /j~/jh/ are clearly marked in the child.
9. The retroflexes have been acquired correctly and are no more substituted by the dentals. The retroflex ~ dental contrast shows clarity.

GI and GX

1. All vowel sounds – /i/, /I/, /e/, /ε/, /a/, /o/, /u/, /U/ and /ə/ are clearly acquired by the 4 members of the group.

2. The group acquires all the speech sounds correctly except /ph/ which is consistently been substituted by /f/ which now becomes a regular phonetic feature in the children of this group as they are nearing the age of 5.
3. Retroflexes which were substituted by dentals in most of the earlier age groups seems stable and regular by the age of 5.
4. By the age of 5 all the children in the age group share correct and clear contrasts of aspirates with their unaspirated counterparts as in /k~/kh/, /g~/gh/, /c~/ch/, /j~/jh/, /b~/bh/, and /t/ ~/th/, /d/~/dh/, /T~/Th/ and /D/~/DH/ in all the three word positions, except /jh/ in WF test word /sanjh/ as explained earlier is due to the problem of identifying the lexical item rather than the sound.
5. /Rh/ is one of those sounds that are acquired in the formal register of Hindi, primarily through formal education. So, in spoken, conversational style, the child does not hear /Rh/ or does not therefore pronounce it.

The order of acquisition of sounds as indicated in the discussion on these ten groups is summed up in the following chart.

Chart 7. No of children showing correctly acquired sounds:

No. of children	Speech sounds acquired correctly
29-30	i, I, e, ε, a, o, u, U, ə, p, b, t, d, c, j, m, n, h, l, s, z, y, w
27-28	k, kh, g, - gh, gh-, R, š
25-26	ch, ch~s, c,
23-24	jh-, -jh-
21-22	th, Th-, -Th-, r
19-20	None
17-18	bh-, -bh-, bh~p, b
15-16	dh~d,t, T~t, D~d
13-14	None
11-12	ph~f,
9-10	Dh-, -Dh-, Dh~D, Dh~d
7-8	None
6-7	None
4-5	None
2-3	None
0-1	Rh, -jh, -dh, -gh

As indicated in the chart above, sounds in the first columns are those for which 29 or 30 children have responded correctly. This indicates that most of the sounds are acquired before the child reaches the age of 2.11. In the 2nd column there are velars and /R/ and /š/ for which 27 or 28 children responded correctly. Errors, substitutions or no responses are not more than those of 3 children. The responses to WI and WM /gh/ were correct in case of 27 to 28 children.

Hypothesis 1. Velar stops probably appear later than the bilabials, dentals and palatals.

Hypothesis 2. The voiced aspirated velar stop /gh/ appears in the WI and WM positions earlier than in the WF position.

25-26 children responded correctly to /ch/ which means 4-5 children didn't respond correctly, rather alternated this with /c/, /ch/, /s/

Hypothesis 3. /ch/ substitutions by /c/ and /s/ in case of a couple of children can be attributed primarily to their linguistic environment i.e. some dialects of Punjabi spoken at home could be the cause of this substitution.

23 children responded correctly to /jh/ in the WI and WM positions and similarly 21-22 children responded correctly to /Th/ and /th/ in the WI, WM, WF positions.

The only conclusion that can be drawn is that aspirated voiceless stop consonants appear after their unaspirated counterparts and probably in the WI and WM, position at first.

17 to 18 children responded correctly to the voiced aspirated bilabial sound /bh/ in the WI and WM positions.

12 to 13 children responded in correctly to WI and WM /bh/ sound substituting these by unaspirated /b/ and by /p/.

Hypothesis 4. /bh/ substitution by /p/ in the WI position accompanied by some change in tone of the following vowel is certainly the influence of Punjabi spoken at home.

15 to 16 responded to /dh/ in WI and WM positions. /dh/ is generally substituted by /d/ and sometimes by /t/ in the WI position.

Hypothesis 5. /dh/ substitution by /t/ in the WI position accompanied by some change in tone of the following vowel is certainly the influence of Punjabi spoken at home.

/D/ and /T/ have 15 to 16 correct responses in all the three word positions. They are clearly substituted by dental stops.

Hypothesis 6. The retroflex sounds seem to appear later than the dental stops.

11 to 12 children responded correctly to /ph/ in WI and WM positions. The rest of them substituted it by /p/ and /f/.

Hypothesis 7. /ph/ alternating with /f/, almost as if they were in free variation is the result of the linguistic environment prevailing in Delhi.

9 to 10 children responded correctly to /Dh/ substituting it by /d/, /D/ and /T/. 20 to 21 children responded in correctly to it.

Hypothesis 8. The aspirated sound substituted by the unaspirated ones show that /Dh/ appears later than /D/

Almost the entire group (29-30 children) responded incorrectly to /Rh/ in WM and WF positions, /jh/ in the WF position and /gh/ in the WF position.

The first conclusion that can be drawn from the almost nil correct responses is that the WF aspirated stops especially in case of voiced stop consonants seems to be a problem for most of these children, upto the age of 4.11 in this group. The reasons could be many which can be discussed by the specific sounds and the test words used as follows.

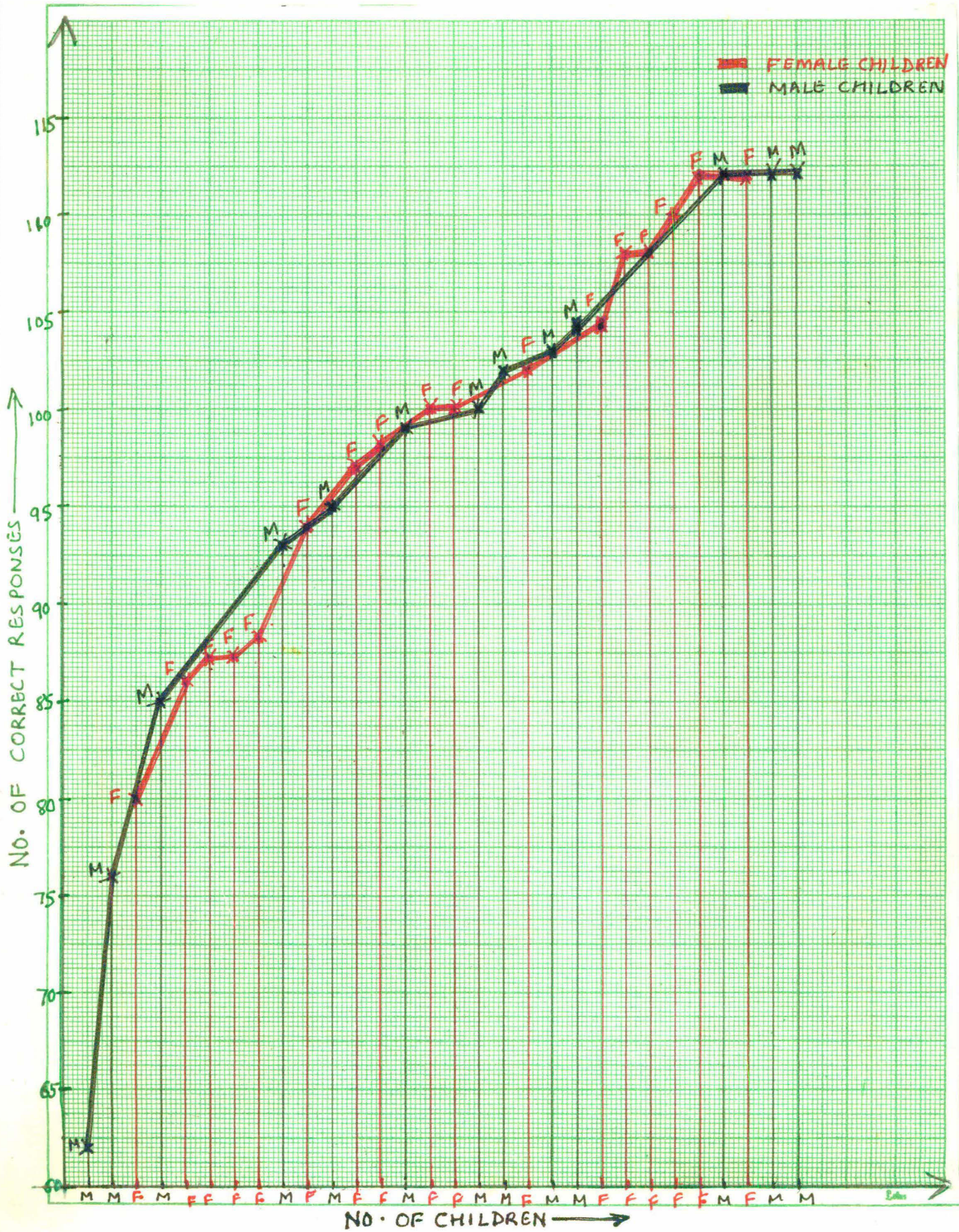
The test word used for /jh/ in the WF position is /sānjh/. Many children didn't respond to it at all as they didn't recognize the test word. When they were asked to repeat or imitate the word, then the substitution for /jh/ was clearly by unaspirated /j/. In this case the problem is primarily with the lexical items and not the speech sound.

Likewise WF /gh/ was almost always mispronounced substituted by /g/ and the lexical item /bagh/ was substituted by /šer/ by number of children.

Hypothesis 9. Some of the sounds like /Rh/, in all word positions /jh/ and /gh/ in WF positions are generally acquired as part of formal education and perhaps not from the home environment. One more sound which was dropped after pre-testing was /ɔ/ which is also acquired later than the age of 5.

Table 3. No. of Correct responses to the test words by male and female children.

Sl. No.	Male	Female
1.	62	
2.	76	
3.		80
4.	85	
5.		86
6.		87
7.		87
8.		88
9.	93	
10.		94
11.	95	
12.		97
13.		98
14.	99	
15.		100
16.		100
17.	100	
18.	102	
19.		102
20.	103	
21.	104	
22.		104
23.		108
24.		108
25.		110
26.		112
27.	112	
28.		112
29.	112	
30.	112	



*** Explanation for the Graph**

As indicated in the Graph one could perhaps draw the following conclusion.

1. Correct responses by the youngest child could be treated as the threshold of age 3.
2. After the threshold level i.e. from age 3 onwards there seems to be a quick and sudden increase in the no. of correct responses.
3. Between the age of 3 and 5 there is a gradual increase in the no. of correct responses in both male and female children.
4. Female children perform slightly better than the male child in the same age group.

The present research has been a study at a preliminary level as it has tried to explore a very small area within the vast arena of Paedolinguistics. As the study is focused on the speech and language development in normal children it can be considered as a reference point for two kinds of researches – first, as this is a research in cross-sectional technique, it can be extended and expanded to the level of longitudinal research which could examine all other levels of Linguistics (Morphology, Syntax, Semantics and Pragmatics) besides Phonetics and Phonology in a single child since his birth.

Secondly, the present study opens up the way to conduct research on delayed learners and provide them with necessary speech and language therapy.

I look forward to pursue my Ph.D. research in one of these topics which would help me explore the world of children in depth.

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