EARLY SPEECH AND LANGUAGE DEVELOPMENT : TWO CASE STUDIES

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CERTIFICATE

This dissertation entitled **"EARLY SPEECH AND LANGUAGE DEVELOPMENT : TWO CASE STUDIES"**, submitted by *SUMAN KALRA*, Centre of Linguistics and English, School of Languages, Jawaharlal Nehru University, New Delhi for the award of the degree of **MASTER OF PHILOSOPHY**, is an original work and has not been submitted so far in part or in full, for any other degree or diploma of any other university.

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FOR MY DAUGHTER NEHA

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CHAPTER I

INTRODUCTION

The study of speech acquisition and language development has been an important area of investigation for speech scientists, linguists, psycholinguists, neurologists and cognitive scientists alike. The reason being the complex nature of language and the apparent ease and swiftness in acquiring this complex system of language by native children. Language Acquisition according to Pit Corder (1982) takes place in the infant and the young child at a time when he is acquiring many other skills and much other knowledge about the world. It is a subconscious process which occurs naturally and informally. The study of the process of speech acquisition and language development is concerned with how a child acquires a language system as his mother tongue. It investigates the processes involved in acquiring language by a spontaneous and informal interaction with his native environment. This complex process of development including acquisition of speech and language has been studied by different scholars following a number of different approaches, ranging from the most casual jottings of the parents, their observation of their children's developments put down on paper, to sophisticated and systematic elicitation and analytical

techniques of the later periods. As far as the more systematic studies of the later period are concerned, basically, there have been two approaches to the study of language and language acquisition which are the Empiricist's approaches and Rationalist's approaches. Empiricists believe that language acquisition is the result of "experience" and "environmental influences" whereas rationalists believe that the process of language acquisition is an "Innate Endowment or an Inborn Mechanism triggered by environmental influences". (Ingram, 1975 : 221).

Clark and Clark in their 1977 study discuss issues which are critical for the theory of language acquisition. These are :

1. Continuity in development : This refers to the connections between earlier and later points in development. Close observations and investigations reveal the fact that continuity is found at every stage of language acquisition, between the child's babbling and the first words; between the single word utterance and two word utterances; and between the two, three or more word utterances. The first words of a child as viewed by Clark and Clark (1977 : 298) are "Combination of elements, already present at an earlier stage of development". Another important point to note here is that the continuity

in language development is the result of the continuity in mental and intellectual development of the child.

2. Comprehension and Production : According to Clark and Clark (1977 : 298), there is an "asymmetry" between these two processes and comprehension appears quite early in acquisition as "children often seem able to understand more than they can actually say". A number of studies, such as Lenneberg (1967), Lewis (1951), McCarthy (1954) , McNeill (1966), Smith (1970) also show that comprehension precedes production. Children comprehend before they actually produce the language. A study carried out by Helen Benedict (1976) showed that a group of children understood 10 words at a mean age of 10 months and 14 days, but the same number of words were produced by them at the mean age of 13 months and 21 days.

3. Innateness in Language : According to this view, "Language acquisition is the result of innate capacities specific to language and is thus found only in human beings" (Clark and Clark, 1977 : 298). Those who believe in this view are called "Nativists" as opposed to the "Empiricists".

Before going into the details of the earlier studies in the area, a composite table prepared by Dorothy McCarthy

in `Language development in children', pp.491-630 in Carmichael L. (ed.), Manual of Child Psychology (1946 reprint 1968) is being reproduced below for ready reference. This table indicates age in months at which selected language items are reported in eight major studies of infant development. These eight studies were reported between 1925 (Gesell) and 1940 (Cattell). For the later studies after 1940, there is a separate section after this chart.

TABLE 1

COMPOSITE TABLE SHOWING AGE IN MONTHS AT WHICH SELECTED LANGUAGE ITEMS ARE REPORTED IN EIGHT MAJOR STUDIES OF INFANT DEVELOPMENT

	Strictly Longitudinal		Principally Cross- Sectional					
	Bayley (1993)	Shirley (1933)	C. Buhler (1930)	C. Buhler & Hetser (1935)	Gesell, Thompson & Amatruda (1938)	Gesell & Thompson (1934)	Gesell (1925)	Cattell (1940)
1. Vocal grunt		0.25						
2. Differential cries for discomfort, pain, hunger						1		
3. Vocalizes small throaty noise					1.3			
4. Vocalizations	1.5							
5. Makes several different vocalizations						2		
6. Makes several vocalizations								
7. One syallable							4	
8. Vocalizes ah, uh, eh		2			1.3			
See Items 26-33								
9. Attends readily to speaking voice						2		
10. Reacts positively to human voice				2				
11. Responds to voice	1.3							
12. Turns head on sound of voice					4			
13. Voice, attends (supine)								
14. Voice, turns to (sitting)								2 4
15. Cooing			2	3				
16. Coos					3		4	
17. Babbles or coos								2
18. Returning glance with smiling or cooing			3					
19. Coos to music							6	
See Item 22.								
20. Two syllables		3						
21. Gives vocal expression to feelings of pleasure						3		
22. Actively vocalizes pleasure with crowing or cooing						6		
23. Vocalizes pleasure	5.9							
See Items 15-19, 36-37, 43-44								
24. Vocalizes to social stimulus	3.1							
25. Responds vocally when socially stimulated						4		
See Items 38, 60								
26. Vocalizes in self-initiated sound play						4		
27. Articulates many syllables in spontaneous vocalizations							6	
28. Vocalizes several well-defined syllables						6		
29. Says several syllables	6.3							
30. Vocalizes ma or mu					6.5			
31. Vocalizes da					7			
32. Two syllables - 3d repetition of 1st - mama or dada	8				7			
33. Says da-da or equivalent	8.5					9		

	Strictly Longitudinal		Principally Cross- Sectional					
	Bayley (1993)	Shirley (1933)	C.Buhler (1930)	C. Buhler & Hetser (1935)	Gesell, Thompson & Amatruda (1938)	Gesell & Thompson (1934)	Gesell (1925)	Cattell (1940)
34. Gives vocal expression of eagerness 35. Vocalize eagerness	5.6					5		
36. Vocalize displeasure on withdrawal of coveted object 37. Vocalize displeasure	5.9					5		
38. "Talks" to a person See Items 25, 60 39. Distinguishes between friendly and angry talking		6	6					
40. Imitating sounds re-re-re-immediate or delayed response 41. Imitates sounds 42. Incipient or rudimentary limitation of sounds See Items 65, 66, 68			6			10		9
43. Vocalizes satisfaction 44. Vocalizes satisfaction in attaining an object See Items 21-23	6.5					7		
45. Singing tones		7.3						
46. Vocalizes recognition 47. Gives vocal expression to recognition	7.4					8		
48. Single consonants See Items 30, 31		8						
49. Adjusts to words See Items 55, 62					8			9
50. Vocalizes in interjectional manner 51. Vocal interjection	8.1					8		
52. Listens to familiar words See Item 61 53. Listens with selective interest to familiar words See Item 62	8.5					9		
54. Understands gestures 55. Responds to bye-bye 56. Can wave bye-bye and often can say it			9		9		12	
57. Expressive sounds 58. Expressive jargon 59. Uses expressive jargon 60. Uses jargon converssationally	13.5	9				15 18		
61. Differentiates words See Item 52 62. Makes conditioned adjustment to certain words See Items 69-77	9.8					10		
63. Vocalizes in cup-spoon situation 64. Vocalizes in 2-cube situation					10 10			
65. Imitating syllables, mama,			11					

	Strictly Longitudinal		Principally Cross- Sectional					
	Bayley (1993)	Shirley (1933)	C.Buhler (1930)	C. Buhler & Hetser (1935)	Gesell, Thompson & Amatruda (1938)	Gesell & Thompson (1934)	Gesell (1925)	Cattell (1940)
papa, dada 66. Imitates words See Items 40-42, 68	11.7							
67. One word 68 First imitative word (bow-wow, etc.) See Items 40-42, 65, 66		14 15						11
69. Adjusts to commands 70. Inhibits on command 71. Adjusts to simple commands 72. Places cube in or over cup on command 73. Comprehends simple verbal commissions 74. Understanding simple commands 75. Understanding a demand ("Give me that" with gesture) 76. Understanding a command ("Sit down" or "lie down" or "stand up" with gesture) 77. Putting watch to ear on command See Items 62, 95	11.5		15-17 21-23 21-23	13-15	10	12 12	12	
78. Responds to inhibitory words 79 Understanding a prohibition 80. Understanding a forbidding			18-20	16-18	12			
81. Says 2 words 82. Says 2 words or more 83. Says 2 words besides *mama* and dada	12.9				12	12	12	12
84. Vocalizes when looking in mirror					12			
85. Says 3 words or more 86. Says 4 words or more 87. Words, 5					13 13	15 18	18	13-14 15-16
88. Names 1 object (ball, pencil, cup, watch, scissors) 89. Names picture in book (dog) 90. Naming 1 object or more 91. Names 1 picture 92. Names picture in book (baby)	17.4 18.7	19 22.5		19-24		21		
93. Asks with words See Items 101-103 94. Says "Hello," "Thank you," or equivalent							18	17-18
95. Points to nose, eyes, or hair 96. *Comprehends simple questions* See Items 69-77						18	18 18	
97. Names Gesell watch on fifth picture See Item 113.	19.4							
98. Names 2 objects 99. Repeats things said *100. Repeats 4 syllables (2 words)*	19.6			30		21		
101. Joins 2 words in speech 102. Words, combines 103. Uses words in combination See Item 93.						21 24		21-22

	Strictly Longitudinal		Principally Cross- Sectional					
	Bayley (1993)	Shirley (1933)	C.Buhler (1930)	C. Buhler & Hetser (1935)	Gesell, Thompson & Amatruda (1938)	Gesell & Thompson (1934)	Gesell (1925)	Cattell (1940)
104. Names 3 pictures	21.2							
105. Picture vocabulary 3								23-24
106. Names 3 objects	21.5							23-24
107. Names 3 objects in picture							36	
108. Identifieds 4 objects by name								23-24
109. Names 3 of 5 objects						24		
See Items 104-107								
110. Names familiar objects like key, penny, watch							24	
111. Points to 5 objects on card						24		
112. Names 5 pictures						30		
113. Name Gesell watch and picture	24.5							
See Item 97.								
114. Points to 7 of 10 simple pictures							24	
115. Points to 7 pictures	25.1					30		28-30
116. Picture vocabulary 7 (1937 Stanford-Binet)								25-27
117. Names 7 pictures	32.9							25-27
118. Pictures, points to 6								25-27
119. First pronoun		23						
120. Uses pronouns past and plural							36	
121. First phrase		23						
See Items 124-126								
122. First sentence		23						
123. Uses simple sentences and phrases							24	
124. Distinguishes in and under							24	
125. Understands 2 prepositions	25							
126. Understands 3 prepositions	28							

Some of the important studies that have been carried out in the field of child language acquisition after 1940 are discussed in detail in the section below and other studies in the second chapter on "Early Language and Speech Development". The vocalisations (all kinds of utterances made by the infant or a young child) produced by the child change and develop even from one day to another and hence make these studies all the more challenging. The first spectrographic study of the infant's speech was done by Lynip in 1951. He reported the first graphic recordings of two second samplings of the birth cry of one child by means of sound spectrograph. He took weekly graphic recordings of speech of one child for a period of thirteen months though eloborate statistical analysis was not done on this data. This study was definately an important step forward which encouraged later investigators to carry out more refined observations and analysis. Later in 1971, Kostic also traced the development of speech right from the first cry of the child using spectrography techniques. The normal child begins to produce noises and sounds right from the birth and slowly these cries and noises begin to acquire distinct phonetic shapes and certain recurring patterns. The spectrographic study of the earliest developmental stages of speech by Kostic showed that the acoustic field of the first cry is very disorganised with expiration and inspiration intermingled and accompanied by

noise. Immediately afterwards, the expiration is separated from inspiration and starts carrying the phonetic current. Within seven days, the acoustic structure of the cry changes and the formant structures start separating from the noise patterns. These formant structures later develop to be distinguished into vowels and the noise patterns acquire the structures of consonants. The speech organs gradually become more stable. At the end of the fifteen days, one can find that the formant structures have become absolutely free of the noise patterns which is the characteristic property of Sonorants. This shows that the acquisition of speech involves constructs that are functional very early in the life of the infant.

Another most influential and best known study or rather theory of phonological development was formulated by the linguist Jakobson in his pioneer work" Kindersprache, Aphasie and Allgemeine Lautge Setze" (1941, English translation 1968). Jakobson's theory represents the first attempt to explain the acquisition of phonology on the basis of linguistic universals, structural laws, that underlie every modification of language, individual or social.

Jakobson distinguishes two discontinuous periods of phonological development which are

a) The prelanguage babbling period and

b) The acquisition of language proper.

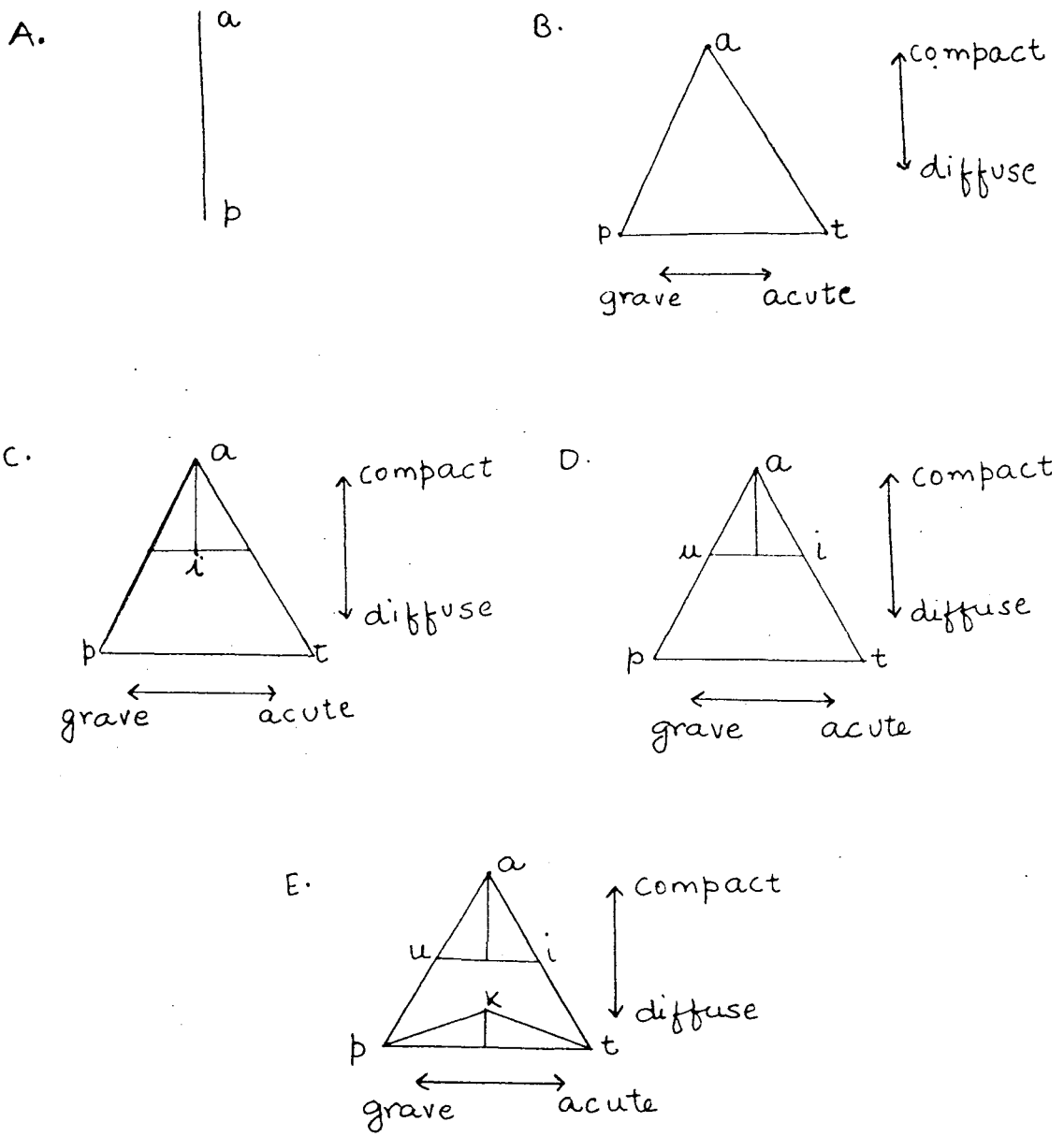
This division of the developmental process into two periods serves to emphasize the difference between the mere production of sounds and the systematic use of those sounds in a phonological system. The division into two periods is based on the widely accepted observations that during babbling, the vocalizations of most normal children exhibit a great quantity and diversity of sound productions (Complex vowels, clicks, palatalized and rounded consonants etc.) but as the child begins to acquire words, most of these sounds disappear and some of them (e.g. sibilants and liquids) reappear only after long effort, often only after several months or years. The phonetic richness of the babbling period thus, gives way to phonological limitation. The beginning of the second period ("language proper") is marked by sound utterances that are employed for designation. "To the desire to communicate is added the ability to communicate something." For the most part one stage merges into the other, so that the acquisition of vocabulary and the disappearances of the prelanguage inventory occur concurrently. (Jakobson, 1968 : 29). The sequence of stages in phonological development is based upon "the principle of maximum contrast" and "development proceeds from the simple and undifferentiated to the

stratified and differentiated."

Jakobson proposed that phonemic development begins with the "Labial stage". The acquisition of vowels begins with a wide vowel usually [a], while at the same time, the acquisition of consonants begins with a labial stop, most commonly [p]. This establishes a phonemic distinction of optimal consonant and optimal vowel. The contrast between these two units in succession establishes the universal model of the syllable-CV (Consonant and Vowel). The earliest meaningful units to appear in child's speech are based on this polarity. In the later stage there is a gradual increase in

a) the number of distinctive features in a phoneme and the number of phonemes in the system;
b) the maximum number of phonemes in the word;
c) the number of possibilities for the distribution of phonemes, and
d) the maximum number of phonemic distinctions within a word. For example, in the earlier stages, only one sound functions distinctively within a given word, usually the consonant, with the vowel remaining unchanged. Later the child can use two different consonants or two different vowels in the same word, but not both the sets at the same time.

Jakobson illustrates the stages of phonological development based on "the priciple of maximum contrast" by means of four triangles which are being reproduced below.



Successive development of the primary triangles as proposed in Jakobson's theory of phonological development adapted from (McNeill 1970).

As explained by means of these triangles, vowels and consonants are joined in a unified system. The fundamental split can be seen along the compact - diffuse axis. This shows the contrast between the back open vowel /a/ and closed front consonant /p/. The successive stage is formed by the split between the consonants, that of the oral and nasal phonemes (/p/-/m/). At the same stage, the pole of high and concentrated energy /a/ contrasts with low energy stops /p/ and /t/. Both stops are opposed to each other by a predominance of one or other of the frequency spectrum as the `gravity' and `acuteness' pole. The Primary triangle then splits into two vocalic and consonantal. The most characteristic feature of vowels is their compactness and so their split takes place along the compact-diffuse axis.

Since the contrast acute/grave 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 is secondary (/i/ - /u/). Similarly, the consonantal split along the vocalic axis compact. Diffuse (/k/ - /t/) does not occur until after the specific split into acute and grave consonant. [Jakobson (1941) as explained by Holenstein (1976)].

The acquisition pattern of phonemic system as described by Jakobson is referred to again in chapter II on

Early speech and Language Development. Another important study was done by Irwin and Lewis in 1946. This was a cross-sectional study as it was done on large number of infants. The findings of this study are summed up as below:

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.

Lewis (1951) studied only one infant's vocal output but made extensive phonetic analysis. He noted that early appearing back consonants (/g/./x/ and /k/) were produced in comfort, the later appearing /m/ and /n/ phonemes were first associated with discomfort but as the infant accumulated experience of relief from discomfort, the sounds become associated with relief. Lewis further believed that other front consonants like /p/ and /b/ produced in the later period were associated with the experience of feeding. The back consonants which appear early are said to be typical of period of comfort, are

associated with the swallowing and belching movements which usually follow feeding. In the prefeeding period, the child typically makes mouthing movements with tongue and lips in anticipation of feeding, which are most likely to result in /m/, /p/, /b/ sounds.

Bever (1961) reanalyzed Lewis data in terms of magnitude and rate of change in production of phonemes throughout infancy. Bever identified three distinct developmental period : 0-3Mo, 4-11 Mo and 12-18 Mo. He showed that there was a cyclic pattern of segmental feature development in each of these periods, within a peak of activity in the mid portion of each cycle. Pattern of vowel and consonant acquisition were found to differ from one-another in a number of ways thus suggesting that `Vocalic activity does not emerge by the same process as consonantal. The developmental period and the cycle of activity, within each, co-related well with other aspects of Neurological development and in Bever's view reflected Central Nervous system maturation.

The Scope of the Present Investigation

The amazingly rapid acquisition of an extremely complex system of symbolic habits by young children has attracted the attention of psychologists and linguists

since ages. Though many studies have been carried out in the past, both longitudinal as well as group studies, some of which have already been discussed early, yet there is still a scope to explore the complex behaviour of language learning which apparently seem so spontaneous and natural to happen to everyone.

The present investigation deals with case studies on two children, both females, from a similar linguistic background aged 6 1/2 months and 9 months, with an aim to study their speech acquisition end language development. The scope of the present investigation had to be restricted due to time constraint. Since the M.Phil studies are time bound and are carried for a period of one year, the focus had to restricted to early speech acquisition and early language development. We were lucky, however, as my own child Neha was around six months at the time of the beginning of data collection and the second subject Prachi was in the very early stages of language development establishing a relationship between sound and meaning. For my Ph.D., however, I plan to study their language development in detail concentrating on other areas like Syntax, Semantics etc. The data was collected for a period of around eight months. Weekly recordings were done on regular basis to take a note of different sounds acquired at different age levels. Lists of sounds acquired at

different chronological age is given in the chapter on discussion and analysis. The detailed description on the acquisition of sounds will be taken up in chapter IV The emphasis in this study is also laid unto those stages which lead to major changes from speech to language, phonetic ordering to phonemic patterning and simple mimicry etc. to self expression.

Speech is very much there from the first cry of the child. Birth cry is very significant as it is the first time that the child hears the sound of his own voice and establishes a relationship between speech and audition. Although the data on speech acquisition are sparse and also confusing, but if we try to outline what the child does developmentally in order to recognize words and begin to talk in a manner similar to an adult, the following seems to occur : Firstly shortly after birth, the child distinguishes between speech and non-speech. The child at this time is also capable of discriminating between speech sound categories and of producing phonated sound. Second, the child observes recurring patterns in human sound sequences and recurring patterns in non-linguistic events. Third, the child recognizes that recurring patterns in human sound sequences occur in conjunction with recurring events, and learns to reproduce aspects of these sound

patterns in certain specific situations. Fourth, the child begins to analyze the contents of these speech sound patterns and the situations in which they are produced. The analysis of this speech sound sequences are then translated into articulatory gesture. Each of these developmental changes on the way to listening and speaking like an adult reflects developmental changes in the comprehension available to the child for analyzing and translating the phonology of the language, analyzing and translating recurring non-linguistic events and finally, relating the two.

Most descriptions on language acquisition indicate that there is a fixed developmental sequence in segmental feature production from reflexive sound making to first word productions. Inspite of individual differences, the progression may have certain aspects which are universal. Since the normal order and patterning of verbal development has been studied in great detail, as reported in previous section and also to a certain extent in the following section, this study will try to investigate whether a similar or definite order of development can be demonstrated in emergence of phonetic and phonemic patterning in these two children. Some specific questions that we would like to tackle in the present study regarding the fact of speech acquisition and language development can

be tentatively framed thus;

1. Is the acquisition of sounds gradual/abrupt.
2. What kinds of syllables appear first.
3. What syllabic combinations appear earlier than others.
4. Is there a common pattern of acquisition of speech sounds.
5. What is the frequency of occurence of a particular sound.
6. Which of the sounds acquired are recurrent/non-recurrent.
7. Whether vocalic sounds appear earlier than consonantal, if yes, which ones.
8. Which consonants appear earlier than others.
9. What sounds acquire phonemic function and at what stage.
10. Which phonemes of the language (Hindi/Punjabi) are established (if at all) and at what stage.

Each one of these questions and many others realted to these arising during the course of this study were examined closely by analysing the data in Chapter IV. Before discussing the methodology and procedural steps, it is imperative to look into stages of speech and language development as discussed by various authors. The following chapter gives a description on early stages of speech and

language development in general followed by previous studies done in the area of child language acquisition. The third chapter contains methodological details of data collection, recording, transcription and elicitation techniques employed. Chapter IV is devoted to analysis and discussion while the last chapter contains summary and conclusions.

References

Beg Mirza Khalil, A., (1991) Psycholinguistics and Language Acquisition. Bahri Publication, New Delhi.

Carroll, J. B. (1960) `Language development in children', in - Sol Saporta (ed) Psycholinguistics - A Book of Readings; (pp. 331-342), Holt, Rinehart and Winston, New York.

Clark, H. H. and Clark, E.V. (1977) Psychology and Language : An Introduction to Psycholinguistics. Harcourt Brace Jovanovich, Inc., New York.

Corder, S. P. (1982). Introducing Applied Linguistics Harmondsworth, Middlesex : Penguin Books (First Published 1973).

Ferguson, C. A. and Slobin, D. I. (1973) Studies of Child Development. Holt, Rinehart and Winston, Inc., New York.

Ferguson, C.A and Farwell, C.B. (1980) `Words and sounds in early language Acquisition', Language. J 51 (pp. 419-439).

Holenstein, E. (1976) Roman Jakobson's Approach to Language. Indian University.

Ingram, D. (1979) `Phonological Development' in P. Fletcher and M. Garman (eds) Language Acquisition.

Jakobson, R. (1941/68) Child Language, Aphasia and Phonological Universals. The Hague: Mouton, Translation by R. Keiler of original German version of 1941.

Jakobson, R. and Halle, M. (1981) `Phonemic Patterning' Sol Saporta (ed) In Psycholinguistics - A Book of Readings. (pp.346-348), Holt, Rinehart and Winston, New York.

Leopald, W.F. (1961) `Patterning in Children's language learning' in Sol Saporta (ed) Psycholinguistics : A Book of Readings. (pp. 350-58), Holt, Rinehart and Winston, New York.

Lewis, M. M. (1951) Infant speech : A Study of the Beginnings of Language. London : Routledge and Kegan Paul (First published 1936).

McCarthy, D. (1954) `Language Development in children'. In Carmichael, L. (ed.), Manual of Child Psychology. Second edition (New York, Wiley)

McNeill, D. (1970) The Acquisition of Language. Harper and Row publishers, New York.

Smith, N.V. (1973). The Acquistion of Phonology : A Case Study. Cambridge, Cambridge Univ. Press.

CHAPTER II

EARLY SPEECH AND LANGUAGE DEVELOPMENT

The development of speech production skills in infants and young children may be viewed as occuring in a sequence of stages, each of which is related to the preceding one in a coherent way. This orderly progression appears to have certain universal aspects though individual differences are found within each stage:

An important point to note here is that these stages of language development are observed in normal infants and probably, in the same sequence, at a slower rate in many retarded children. In this sense, the development of speech may be like the development of motor skills in general and of intelligence in the sensori - motor period.

Stages of language development have been discussed by various scholars with focus on one or the other aspect. For example Kostic discussed the acoustic aspect, Jakobson articulatory and Ingram therapeutic aspect. Stages of speech and language development as discussed by many scholars like Kostic, Jokobson, Oller et.al. etc. are given below :

1. Reflexive Vocalizations (0-6 weeks)

These vocalizations comprises of cry and fussing

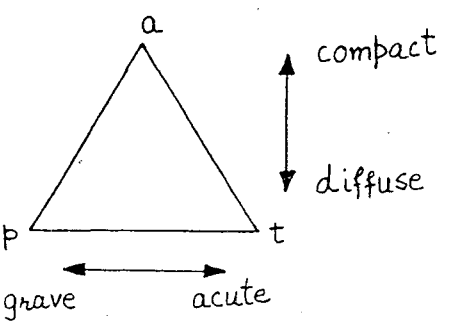
(discomfort) sounds and vegetative sounds (burping) etc. The major portion of these vocalizations are vowels as discussed by Jakobson in his triangles. See chapter I for details. This finding has also been corroborated by Kostic (1971) in spectrographic details of infants vocalization.

2 : Cooing and Laughter (6-16 weeks)

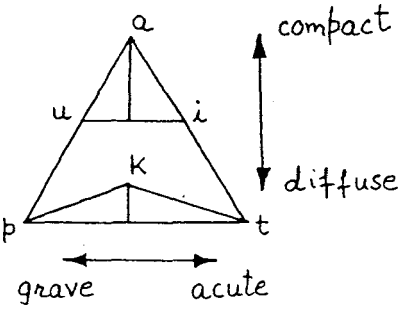
Cooing (comfort) sounds are produced in comfortable states usually in response to smiling and talking or pleasurable interaction with mother, adult or older child but may subsequently be elicited in situation that do not involve interaction.

These cooing sounds are referred to as vowel - like; but also contain brief consonantal elements (Lewis etal 1936; Nakazima 1962; Oller etal 1976; Stark etal 1976)

According to Oller (1976) these cooing sounds have a Quasi-Resonant Nueleus (QRN) i.e. they take the form of a syllabic nasal consonant or a nasalized vowel. (Refer to Jakobson's triangle for details)



Here, the mouth is less widely open than during cry. Back consonant are generally produced.



3 : Vocal Play (16-30 Weeks)

Vocal play is characterised by playful use of behaviours like squealing, growling, yelling loudly, production of noises by blowing air, food or saliva through constriction in mouth or pharynx and nasal murmers. During this stage, long series of segments are found in which consonantal and vocalic elements both occur but they do not resemble syllables or adult speech in their durational aspect or other articulatory features. This is referred to as Marginal Babbling by Oller (1977). In this later form of vocal play, consonantal and vocalic elements are combined with each other in new and interesting ways.

4 : Reduplicated Babbling (25-50 weeks)

This babbing is characterized by a series of CV syllables in which each syllable is perceived as being similar to every other for example /ənɔnə/ or /ɹdɹdɹ/.

Labial, alveolar stops, nasals and glides are the most frequently used consonants in this babbling. The vowel nuclei are all fully resonant at this time.

In addition, Oller and Smith (1977) have found that the final syllable of a babbled series shows significantly less lengthening as compared to non final syllable, than in the case of adult speech or adult imitation of babbling. Reduplicated babbling resembles speech much more closely in its timing than the vocal behaviours found in any previous stage.

5 : Non-reduplicated Babbling or Variegated Babblings (10-14 MO)

This stage is characterized by the use of different consonants and vowels in a series and by the use of vowel, V-C, CVC, syllables in addition to the CV syllable type found exclusively in reduplicated babbling. The consonants already found in reduplicated babbling are present in this variegated Babbling. To this fricatives, high front, Mid and high back, rounded and unrounded vowels are added.

Towards the end of stage 5, a variety of stress and intonation patterns are imposed upon non reduplicated babbling.

Some infants spend several months in this activity, others proceed more rapidly to stage 6 i.e. the production of first words.

6 : Single word Productions (Period of variable duration)

These productions in the output of the infant are variously defined. They include

a) PROTOWORDS, with onset at approximately ten months in which phonetically consistent forms are used to refer to primitive experimental groupings as an accompaniment to a regularly occurring set of circumstances (Piaget, 1952) or to gain adult attention and express wishes and demands. (Carter, 1974) and

b) Words used as symbols and to refer to specific, recurring set of objects or events.

Dore etal (1976) identify a transitional period between babbling and first words in which certain phonetic forms are used consistently to express primitive groupings of experience and in play rituals. Also Oller (1976) predicted correctly that babbling would, in continuity with meaningful speech, show the following characteristics.

a) reduction of consonant clusters;

b) deletion of Final consonants;

c) devoicing of Final consonants;

d) a greater number of initial stops than initial

fricatives and affricates;

e) a greater number of apical than velar consonants etc.

Although there is agreement about the general nature of these stages and their order of succession, ways of discriminating the onset of each have not yet been clearly specified. The onset of certain stages such as cooing, laughter and reduplicated babbling appears more clearly marked than the onset of others such as single word productions and vocal play.

Babbling as an important activity

The cooing during the first several months gradually develop into a much more phonetically diversified type of random vocalizations called "BABBLING", with both vowels and consonants.

A child during his babbling period can accumulate articulations which are never found within a single language or even a group of languages-consonants of any place of articulation, palatalized and rounded consonants, sibilants, affricates, clicks, complex vowels, dipthongs etc. etc.

As the child continually repeats these sounds during

the babbling period, their motor and acoustic image is necessarily imprinted on him. The observation of deaf and dumb children shows clearly that for normal development the acoustic impression of one's own sound productions is all-important, and that the child reacts to just this perceptual impression when he attempts to imitate his own sound production in the process known as "Auto echolalia".

According to the findings of Gregoire, "the child at the height of his babbling period is capable of producing all conceivable sounds; but this is surprising that the child then loses nearly all of his ability to produce sounds in passing over from the pre language stage to the first acquisition of meaningful word".

Transition from babbling to first word

The selection of sounds in the transition from babbling to language can be accounted for solely by this transition itself i.e. by the newly acquired function of the sound as a speech sound or more accurately, by the phonemic value which it comes to have.

The child seeks to respond to and adapt himself to the person to whom he is speaking in every way, even in changes of volume. This change from the stage of jargon speech to first word stage is marked by the presence of

ideomorphs or self-made words. Before producing adult like words, child uses different self made syllables and words to denote different objects and actions. Child forms his own words. These self made words of the child are called IDEOMORPHS. Different intonation in different situations on same ideomorph may mean different things.

The little beginner learns to recognize the identity of the sound phenomenon, which he produces, hears produced, remembers, and reproduces, first directly and only afterwards indirectly (metalalically). The child distinguishes it from other phonological phenomenon which he has heard, retained and repeated and this distinction, which is felt as an inter subjective and constant value, strains toward a meaning. To the desire to communicate is added the ability to communicate something. The dummy dialogue becomes a true dialogue and as soon as sound utterances "are employed for the purpose of designation", the actual stage of language formation is launched. Child expresses in his first words important objects, events and persons from daily experiences. The next section discusses various studies done in the area of Child language acquisition from 19th C. till present.

PREVIOUS STUDIES : STATE OF THE ART

Studies on language acquisition or child language began at the end of the nineteenth century. (Taine (1876), Preyer (1893), Tracy (1893), Moore (1896) etc.) These studies were carried mostly by parents observing the language development of their children and maintaining "diaries" of utterances. These "baby biographies" form the basis for the most detailed reports and descriptions on language acquisition in children. David Ingram (1989 : 7) has divided the history of child language studies into three major periods :

1. The period of diary studies (1876-1926).
2. The period of large sample studies (1926-1957).
3. The period of longitudinal studies (1957-Present)

This division is done to show the major shifts in the type of studies done though there is overlap between the two periods i.e. the "diary studies" do not end with 1926 as numerous studies of this nature have been conducted even after 1926. Similarly "large sample" which has been used to refer to the collection of data from a large number of subjects may also refer to the large amount of language samples collected from a single child. The term "Longitudinal" refers to the study carried on one infant for a period of time aiming at a particulars goal. In this

sense, diary studies are also longitudinal.

The first major period was of "diary studies" and the earliest attempt in this made was by H. Taine (1876), with the publication of his daughter's linguistic development right from her birth to the end of the second year of life. The next remarkable study by Preyer in 1882 was the result of detailed daily notes which he made throughout the first three years of his son's linguistic development. Preyer's study confirmed the commonly observed fact that "children comprehend more than they produce", as his son at the age of 1.5 could comprehend 50 word items but produced only two. Preyer also observed that children express various feelings and moods, not by words but by means of the voice. (Quoted in Ingram 1989 :11).

At the beginning of the twentieth century, Clara and Wilhelm Stern made detailed observations on the linguistic development of their two children Hilde and Gunter with emphasis on the "stages" of language acquisition. Another most cited study of language acquisition is the detailed work by Leopold (1939-1949) consisting of four volumes, on her daughter Hildegard from her birth to the age of two years. Velten (1943) was the first major phonological diary to appear in support of Jakobson's theory of phonological acquisition. He took into account the

acquisition of language of his daughter, Joan, and discussed the major phonological patterns acquired by his daughter. The study by Smith (1973) on his son's phonological development is probably the most recent diary study in which he states that, the child does not have a system of its own and his/her phonology can be analysed usefully only in relation to the adult system.

The next period of child language studies is characterized by observations of a large number of children and collecting data from them. There was a major shift in the methodology adapted in these studies as large number of children/subjects were selected for systematic observation of behaviour and language development. Some of the major sample studies conducted between 1926 and 1957 are, as of McCarthy (1930), Wellman et.al/ (1931), Young (1941) and Templin (1957).

The modern period of language studies was characterized by Longitudinal language sampling. According to Ingram (1989 : 21), in this method The child is visited at predetermined intervals for a reasonable length of time with the purpose of collecting a "representative sample". The diary studies consisted of detailed notes whereas longitudinal samples consisted of complete language sample for some determined length of time aiming at a specific

goal. These studies began at the end of 1950's and the investigators like Miller and Ervin (1964), Brown (1973) and Bloom (1970) all investigated their subjects on the basis of systematic visits by visiting them on a regular schedule at regular intervals for a fixed amount of time. During this period of today's longitudinal studies, we find much more specific purpose and goal being pursued with much more sophisticated and refined techniques of handling speech data. For instance, spectrograhic studies conducted by Lynip (1951), Kostic (1971) described in detail in the introductory chapter (pp.9). Similarly even cross-sectional studies like those concentrating on phonological development like Jakobson (1968), Irwin (1951) etc. also show much more refined data handling. More details of the data handling procedures and analytical techniques are described in the following chapter on "Methodology".

References

Bloom, L. (1970) Language Development : Form and Function in Emerging Grammers. Cambridge, Mass : MIT press.

Brown, R. (1973) A first Language : The early stages Cambridge, Mass : Harvard University Press.

Ingram, D. (1989) First Language Acquisition : Method, decription and explanation Cambridge : Cambridge University Press.

Ingram, E. (1975) `Psychology and Language Learning'. In J. P. B. Allen and S. P. Corder (eds.) Papers in Applied Linguistics. (The Edinburgh course in Applied Linguistics, Vol. 2). London : Oxford University Press.

Jakobson, R. (1941/68), Child Language, Aphasia Phonological Universals. The Hague : Mouton, Translation by R. Keiler of origin german version of 1941.

Leopold, W.F. (1939-49) `Speech Development of a Bilingual Child : A Linguist's Record Vol. II' Second Learning in the First two Years (1947), North Western University Press.

Mccarthy, D. (1930) `The Language Development of the Preschool Child', Institute of Child Welfare Monograph Series 4. Mineapolis : University of Minnesota Press, 1930.

Miller, W and Ervin, S. (1964) The Development of Grammer in Child Language", In Bellugi and Brown (1964 : 9-34).

Preyer, W. (1882/89) `Die Seele Des Kindes. Leipzig', (English translation by H. W. Brown, The Mind of the Child, 2 Vols. New York : Appleton 1888-89.

Oller, D.K. (1980) The Emergence of Speech in Infancy (pp.93-112), - Grace, H., Kavanagh, J.F. and Ferguson, C.A. (eds.), Child Phonology, Vol.I, Academic Press.

CHAPTER III

METHODOLOGY AND PROCEDURAL STEPS

Various Methods and models have been in use for a number of years for conducting studies related to speech and language acquisition. These studies are either longitudinal or cross sectional; depending on the goal of the study. In a cross-sectional study, an investigator might look at several subjects, several age groups, simultaneously. In a longitudinal design the investigator follows certain subjects over a given time period observing and measuring change. The cross-sectional design is quick to do and is appropriate if the main interest is in what abilities or behaviours are typical at certain ages. Because of the convenience of this method, the majority of developmental studies have been cross-sectional. Longitudinal designs are generally preferable if the focus of interest is the process of change and the relationship between earlier and later behaviour. The section below discusses the literature on methodology adopted in developmental studies from 1930's to the present.

There is a large body of literature available on child language acquisition right from the period of "Parental diaries" to the present time. The earliest studies on language acquisition were mainly based on

observation and carried out mostly by parents observing the language development of their children and maintaining "diaries" of their utterances at regular intervals. These studies were mostly longitudinal and involved greater amount of subjectivity. Normally the parents were researchers in these development studies who were generally not trained to do the job. Inspite of this major handicap, they sometimes provided enormous amount of data as they were constantly in touch with the children and the children are most comfortable with their parents at such a young age. These studies though provided enormous linguistic data for research, yet "they were unsystematic, focused on single subjects and provided little measurement of the child's Behaviour". (Ingram, 1989) The middle period of child language studies was characterized by observation of large number of children and were mostly cross-sectional. The data from them was collected mainly by tape-recording. Recording brought in greater objectivity in elicitation and descriptive techniques. In the later stages of this period, the recorded data available from large number of children was subjected to analyses by various statistical and instrumentation techniques depending on the nature and goal of the study. The two major spectrographic study carried out during this period were Lynip (1951) and Kostic (1971) which have already been

discussed in chapter on introduction (p.9). The modern period of child language studies was again characterized by " Longitudinal language sampling", as opposed to cross-sectional studies of the middle period. At this stage, the elicitation techniques and the investigation tools as well as the analytical procedures were much more refined. According to Ingram (1989), "In longitudinal studies the child is visited at pre-determined intervals for a pre-determined amount of time with the purpose of collecting a representative sample". The subjects in this study are selected especially for the purpose and data collection procedure etc. vary according to the goal of the study.

The present study traces the speech and language development of two infants for a period of around 8 months and has the following features

1. It is a longitudinal study carried out on two infants, aged 6 and a half months and 9 months respectively with an aim to study their speech and language development.
2. Data was collected mainly by tape-recording the sounds and utterances produced at regular intervals.
3. The Elicitation of data was done mainly by repetition and imitation.
4. A list of verbal stimuli words associated with common day to day experiences was prepared to elicit responses

from the young subjects.

5. The available data was then transcribed in narrow phonetic transcription using IPA while the stimuli provided by the parents were transcribed phonemically keeping in mind the bilingual Hindi/Punjabi set up.
6. A general description of overall language development was also given to show the broad (macro linguistic) overall communication pattern. Details of the comprehension and production of various vocabulary items was noted separately.
7. Weekly charts were made to note the speech development regularly.
8. Recurrent and non-recurrent sounds or one time utterances were recorded separately.
9. Recurrent sound pattern were observed more closely to establish the order of acquisition of various sounds.
10. The speech sounds acquired by younger child were also compared with that of the older one.
11. During the later stages (10-15 months) each one of the sounds was also observed to note its phonemic or non-phonemic status in the language of the child.

A detailed discussion on these observations is given in chapter four on analysis and discussion.

1. Subjects : Both the subjects, Neha and Prachi, aged

6.5 months and 9 months respectively are normal children, without any kind of obvious mental or physical defect or evidence there of, belonging to the same socio-culture and Linguistic background which means that the variations due to these factors should be minimum. Since they are both females, there is no variation of any kind due to the gender differences either.

It is generally seen that first year of life witness rapid physical and mental growth in infant. These new developments, in cognition, language production, and learning skills shows changes in child's behaviour pattern everyday. Hence between the two subjects a period of two and a half month is quite crucial and it is expected that the younger one will approximate the stages already achieved by the elder one.

Neha, the younger subject aged 6.5 months stays in a nuclear setup. She is the only child in the family, and is the first daughter of the researcher. She receives constant stimulation from her parents who are with her all the time. Prachi, the second subject, aged 9 months also stays in a nuclear set up. She is the second child in the family and has an elder brother, aged 4 years who provides her with an extra stimulation, linguistic and inspirational.

2. Elicitation Techniques : Initially it was suggested to have weekly recordings for both the children, but due to some unavoidable circumstances, it could not be done regularly for Prachi. As Prachi's mother is not a researcher herself she could not co-operate with us in recording the data. She could only provide us with the second hand information which was mainly by keeping the dairy of her utterances at regular intervals. The only data received from Prachi was in the form of utterances as heard/perceived by her mother.

Neha, the younger one, being my own daughter was constantly observed for speech and language development. The data from Neha was collected mainly by tape-recording which was done approximately every six to ten days. As the subject is very small, it was quite difficult to get voluntary response from her. To take care of this, a list of stimuli was prepared to evoke verbal responses from her. These words were used depending on the context and situation in which the child was at the time of recording. The recording was also done when child was playful on her own and was deriving pleasure by manipulating and experimenting with her vocal apparatus. At later stages of recording, books and toys also helped in eliciting responses from her. Most often, she produced utterances by

imitation. The notes were also prepared and sounds transcribed either on non-availability of recorder or outside home as and when required.

3. Transcription of the data : The child's utterances were transcribed phonetically, using IPA as her responses were not meaningful all the time, whereas the adult's utterances were transcribed phonemically. Linguistic stimuli in phonemic transcription and the data elicited in phonetic transcription has been reproduced in detail in the appendix (Section A). The phonemic transcription was keeping in view the Hindi/Punjabi bilingual set up, as seen in Punjabi speaking families of Delhi, where Hindi is the dominant language Hindi and Punjabi are cognate languages belonging to the Indo-Aryan family. So a number of similarities are seen in their phonological patterns. The two phonemic patterns are summed up by the means of charts given below.

PHONEMES OF PUNJABI :

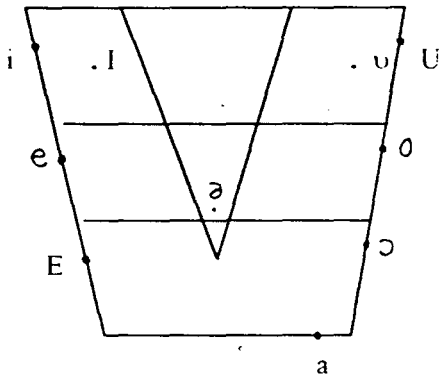
Point of Art. / Manner of Art. → / ↓	Bilabial	Labiodental	Dental/ alveolar	Retroflex	Palatal	Velar	Uvular
Stops vl.	p p^h		t t^h	ṭ $ṭ^h$		k k^h	
Stops vd.	b		d	ḍ		g	
Affricates vl.					c c^h		
Affricates vd.					ɟ		
Fricatives vl.		(f)	s		š		h
Fricatives vd.		v	z				
Nasals	m		n	ṇ		[ŋ]	
Laterals			l	[ɭ]*			
Trills			r				
Flaps				ṛ			
Approx.	[w]				y		

* /ɭ/ is dialectical; found in some dialects of Punjabi

PHONEMES OF HINDI :

Point of Art. → / Manner of Art. ↓	Bilabial	Labiodental	Dental/ alveolar	Retroflex	Palatal	Velar	Uvular
Stops vl.	p p^h		t t^h	ʈ $ʈ^h$		k k^h	
Stops vd.	b b^h		d d^h	ɖ $ɖ^h$		g g^h	
Affricates vl.					c c^h		
Affricates vd.					ɟ $ɟ^h$		
Fricatives vl.		(f)	s	ʂ	ʃ		h
Fricatives vd.		v	(z)				
Nasals	m		n	ɳ	[ɲ]	[ŋ]	
Laterals			l				
Trills			r				
Flaps				ɽ $ɽ^h$			
Approx.	[w]				j		

Vowels



(NARANG, 1984, pp.i)

The Phonemes common to Hindi and Punjabi are :

Vowels |a *| |I| |ɪ| |ʊ| |u| |e| |E| |o| | | | |

Consonants |p| |ph| |b| |m| |t| |th| |d| |n|

|ṭ| |ṭh| |ḍ| |ṇ| |c| |ch| |j| |k|

|kʰ| |g| |ŋ| |r| |ṛ| |l| |s| |ś| |h|

|z| |y| |w|

* | | represents / /

4. Data on Early Language Development : As regards point 6, the notes and recordings were looked at closely to give a detailed description of the overall language development. Apart from the data elicited and recorded, the researchers' personal experience and observation of the subject during that period also helped in gathering information on the overall pattern of communication. Weekly recordings were done to take care of the recurrent and non-recurrent sounds occuring at different stages of the development. This is generally observed that the child produces all possible sounds during babbling and vocal behaviour is a random activity, subject to no linguistic and phonemic laws. Some of the sounds produced during this period are repeated often and gets established as part of the child's total repertoire in no time, whereas some other get lost and are non-recurrent. Depending on the phonemic function and status in the language, these sounds reappear in recurrent patterns at later stages. This is again dealt in detail in the chapter four. The data of the younger subject Neha was than compared with the data available from Prachi to confirm the findings. The sounds in the verbal repertoire of Neha was then tested for its phonemic values. The details of the above are discussed in chapter on analysis and discussion.

CHAPTER IV

DISCUSSION AND ANALYSIS

It is impossible to conceive of a human society functioning without language. The use of symbolic speech is uniquely human, man's most distinctive and perhaps his most complex achievement. The study of the acquisition of language is one of the most exciting and fascinating aspect of developmental studies. Starting from crying, early cooing and babbling, children gradually acquire the complex patterns of the adult phonology of their language. This level of precision and theoretical insight is hard to match in other areas of child development. The section below discusses the macro - linguistic patterns of communication, as acquired by Neha till the age of 15 months. It also takes into account the physical and physiological aspects of speech and language development. The last and the major section has a detailed description and analysis on each one of the sounds as they develop.

The first use of the vocal apparatus is the birth cry produced by the infant. It is of significance for the development of language because it constitutes the first use of the delicate respiratory mechanisms which are to be involved in speech. The physical structures involved are

the lungs, the windpipe at the top of which are the vocal folds, the glottis - the cavities of the throat, nose and mouth with their intricate system of muscles, the hard and soft palates, the gums, the teeth and the lips. The marvel of speech, however, lies in the regulation and the co-ordination of these various parts as they operate to produce the great variety of speech sounds. This co-ordination and regulatory activity which we take for granted while describing the production of speech also involves through a complex process. The Birth cry is the first time when child hears the sound of his own noise and hence a relationship between audition and production is also established. After the first acquisition of sounds, there seems to be a rather rapid increase in the variety of sounds, so that by the third month, most observers of infant behaviour report cooing and babbling which continue until about the end of the first year, when the first words are heard. The child during this period, discovers the sound while communicating with people around through paralinguistic communication or sometimes accidentally while playing with his speech organs. The child also recognises that sounds do not develop independent of meaning. Different aspects of language i.e. `structure' (the basic units, words, and sounds and rules for arranging them) and "meaning" (conventional, arbitrary signs for

referents, for objects and events) may be studied separately but the process is a complete integral whole. Sounds do not develop independent of meaning. The child, for instance, learns that words refer to events and things which are part of his world of experience. Later, he also learns that word refers to proper object and relationships. The next step that the things and activities both have names i.e. (Noun and verb) establishes much later which is the beginning of the learning of syntax.

The sections below discusses the speech and language development of the child Neha from her first speech sounds to meaningful utterances. The different sounds acquired at different chronological period will be taken up later.

It was noticed that like other infants, the first vocal response which Neha made was her "birth cry". In later periods, crying was made to convey basic physiological needs such as hunger, thirst etc. and later to express state of discomfort. Though crying did not convey any symbolic function, but it is definitely the origin of communication as mother immediately meets the needs of the infant. She used to cry differently to convey different kinds of information. The cry of hunger used to be initially quiet and intermittent and gradually became louder, whereas a pain cry, or cry when she was not

attended to immediately was loud from the onset itself. The level of Neha's crying also used to convey information about her needs to the parents; which meant different things in her context and situation.

From about the age of one month, she began to utter sounds. These sounds were generally undifferentiated and usually "aaa" and "ooo" like sounds. Such vocalisations have earlier been referred to as "soft cooings and utterances that delight parents" [Irwin (1949 :22)]. These vocalisations of Neha had no directed purpose or meaning and it was also noticed that generally those sounds were phonated rhythmically. These pleasure sounds vocalised by her were usually observed after feed and sometimes after good sleep. These sounds were accelerated by the mother's talking to the child. It was also observed that as she grew, her vocalisation also differed in the duration and pitch. The variety in vocalisation was seen as months passed by and at about 6-7 months, she started babbling.

The following developments and sequencing were observed from birth to 7-8 months regarding vowel production of Neha.

a) After the usual [a] and [u] of crying, she started producing [e] and progressed to [ɛ], [ae], [i] like

sounds. During later period, [i] and [o] were also noticed. [ɔ] was also present but articulated rarely.

b) The vowels produced were long and nasalised such as [ã], [ẽ] and [ũ] etc.

c) These vowels were accompanied with humming or [mm]'s and appeared like [mm], [umm] etc.

d) She also produced gurgling sound when left on her own and when she was playful.

During babbling Neha started producing wider variety of sounds, rich in both vowels and consonants. She uttered these sounds changing both in pitch and articulation, sometimes gradually, sometimes repetitive. Early babbling was repetitive like `baba', `dada' etc. The consonants produced during this period were [h], [g], [c], [p], [b], [m], [t], [d] etc. The correct sequence of acquisition of sounds will be taken up in the next section. During this period it was also noticed that Neha didn't utter sounds to convey any information but probably enjoyed her spontaneous vocal activity enjoying the audition of the same. Some kind of co-ordination between articulatory activity and audition of the same also developed during this period. She used to play with her vocal tools and her own sounds probably stimulated her to utter further sounds, and this was some what like the circular reaction schemata described

by Piaget (1936, 1945). In this kind of schemata observed in stage II of cognitive development as given by Piaget, the child repeats responses which produces interesting results. Neha self-initiated babbling when she was comfortable and contented. During this time (7-8 months) `turn-taking' was also noticed. (If you observe adult conversations, you will find that one person talks, the other listen and responds with gestures, head movements, eye contact etc.; then the listener will take his or her turn to talk while the speaker listens') This is normally regarded as turn taking. She used to im itate the babbling sounds produced by her mother. Other than repetitive syllables, other phonetic composition like [ita] [ida] etc. and semi vowels like [yaya] or labiodental fricatives vava etc. were also observed. Specific informations were also conveyed by changing the intonation patterns, for e.g. to convey state of discomfort she generally raised her pitch. At about 7 months of age. She also comprehended `lie down' /dhəm/. This is also given in the charts at the end of this chapter.

In the later stages of Babbling i.e. around 8-9 months of age, it was noticed that repetitive babbling decreased and it was easier to segment vocalizations into pieces consisting of syllables. She started understanding the importance of sounds to convey information to people

around. She used to shout for attention and found a relationship between sound and meaning. She started obeying simple instructions and identified pictures. During this time it was also observed that though she could not imitate adult's articulation correctly, but she imitated intonation patterns fairly well.

Neha probably realized that the stream of adult speech consists of separable string of sounds as this was reflected in the increased length and structured nature of her babbling. Also her babbling was characterized by the occurrence of an intonation contour with a string of speech sounds. At around 10 months of age, the range of babbling sounds narrowed. She stopped vocal play and probably concentrated on the elementary sounds that appeared in her first words. Though it is quite difficult to determine the exact age at which the first word is used by the child, but it was around 11-12 months of age when she used her first word. The one month variation is taken to see whether she consistently used the same word to express the same meaning. Sometimes her babbled words like `mama', papa, which happened to coincide with the presence of certain persons or events in the environment, were also thought/considered to be the first word.

It was also noticed that Neha's first words consisted

of single or duplicate syllables like papa, dada, dadi etc. Frequently these words functioned as one word sentences; and it was usually by the use of gestures and intonations of the voice, that she conveyed a variety of meanings in different situation for e.g. the single word like `ball' articulated by Neha as [bɔ] may mean

a) There is the ball, uttered in the presence of ball or
b) "where is the ball" or
c) "I want the ball", if uttered with a questioning or demanding intonation.

Neha also expressed new wishes, feelings and needs through these words. Although the data in first words are extremely limited, but these words or utterances indicated that these are not simply names of objects and events but she used prosodic features generatively, productively or creatively to creat sentence type. These words also reflected the stages of cognitive development in which she is progressing. At around 15 months of age, she had vocabulary of around 25-30 words, the list of words which she comprehended and produced is given in the appendix. It was also seen that she was able to perceive and comprehend adult sound difference and correctly assigned the respective sounds to appropriate lexical items but

could not make the difference herself and possibly not even perceived the lack of it in her own pronunciation. The most frequent utterances of Neha were /mɔ mmi/, /m ə mmiji/, /papa/, /dada/, /dadi/, /nana/, /nani/, /bɔ/, /məm/, /t ɔ y/ etc. though she comprehended much more. Infact, at the age of around 14-15 months, she used to express her needs and demands very well through language in every day situation and infact simplified many linguistic items depending on her convenience and her linguistic ability. The aspirates, fricatives, trills were dropped though she understood much more.

The next section discusses the speech and language development of Prachi, the elder subject from the age of 9 months to 18 months.

At the beginning of the data collection, Prachi, the elder subject of our study was around nine months. She had started babbling and also began to establish relationship between sound and meaning. Neha, then, was around 6 1/2 months and also babbled actively though sound meaning relationship was not apparent in her babblings. Different intonation pattern was also observed in Prachi's speech as reported by her mother to express excitement, anger, discomfort etc.

Though it was suggested to have weekly recordings of

her speech, but due to certain unavoidable circumstances, it could not be done. The speech data obtained from Prachi was in the form of notes as provided by her mother. Recordings were also done whenever possible.

Prachi stays in a nuclear set up. She is a very shy child and does not get friendly easily. She is very attached to her parents, especially mother. She has always been seen to cling to her mother until today, whereas Neha inspite of staying in a nuclear set up has the tendency to mix up very quickly. This could also be one reason for Neha to speak more than Prachi. Any attempts made by the researcher to record the speech of Prachi was thus unsuccessful due to this unexpected and unforeseen response by Prachi. So, her mother was the only one who could provide us with the first hand information on her speech and language ability. At times her father also helped. Though extensive data is not available, yet we can discuss few important points by observing her data closely.

From the very beginning, it was observed that Prachi was more active physically and her physical growth was faster than Neha as she started sitting, crawling, standing and then walking at the age which was lower than Neha's subsequently. Sometimes it was thought by the research that the faster physical growth had slowed down her speech

development. This relationship between physical milestones and speech development has been reported earlier by Shirley. Shirley (1933) reported a cyclical relationship between linguistic development and the appearance of certain gross motor skills. Children's vocalizations decreased in frequency during periods when reaching for objects, sitting alone and walking were being mastered. She found correlates between developmental scores on locomotion and vocalization which were all low which confirmed that speech development is held in check by a rapid motor progress. She also states that child resorts to babbling when her fascination for the motor activity has worn off. This phenomenon was also pointed out earlier by Schultze in 1880, who stated that children appear to learn only one thing thoroughly at a time and while the child learn to walk, he pushes aside the development of speech entirely and resumes his linguistic task only after the locomotion is established.

Prachi started babbling at the age of around 7-8 months as reported by her mother. She produced repetitive utterances like [papa], [baba] etc. During this time (8-9 months), she was also comprehending a few items like [cIya], [jhat] etc. In fact her favourite play was `Peek-a-boo', which she enjoys even till today. Prachi had also

acquired certain sounds like [b], [p], [d] etc. which we will discuss later. Then there was a phase when her vocal acitivity was reduced to minimum and she got fascinated by her walking. During this time when she started enjoying her motor development and became less and less vocal. This, however, does not mean that sounds she had already acquired were getting lost. They were infact established already.

At the age of around 11-12 months, Prachi started understanding and comprehending words and verbal commands in everyday situations. The following words were understood by her consistently like [məmma], [papa], [bə ya], [pɻn], [jɻjɻ], [klɛppiŋ], [bayʖ] etc. There was significant development in her comprehension though the production of words was not much.

By the age of one year, she produced following words meaningfully [m ə mma], [papa], [bʰəya], [kao] for cow. According to her mother, Prachi mostly produced utterances by imitation and dropped sounds which she had not acquired in her verbal repertoire for e.g. she used to say [tʰo] [to] for /tʰro/ `throw' in english. The similar kind of phenomenon is also pointed out by Leopald. Leopald (1949) stressed the selectiveness of the child's imitation and pointed out that imitation is not a passive process but

required active cooperation on the part of the child and that the child is the one who chooses what he will imitate.

Neha was a very vocal child from the very beginning and enjoyed playing with her articulators to produce variety of sounds. She used to babble a lot. whereas Prachi was generally very quite. This was also observed by other elder members of the family. Prachi's maternal grandmother (nani), with whom she spends maximum time also reported that Prachi is a quite child and picked up language fast only around one and a half years of age, though her comprehension seems to be normal for her age. She usually used to get excited at the sight of food, and uttered [dal] for /dal/ (any salty eatable) which was her favourite. Otherwise she used to produce [oo] or [ɛɛ] to seek attention or to want something. By the age of fifteen months, Prachi had a vocabulary of around 15-18 words as reported by her mother. The list of the words produced by her is given in the appendix. It was observed that at the age of 17-18 months, Prachi picked up words with a remarkable speed. Her fascination for physical activities, probably reduced and she tried to imitate any word she was exposed to depending on the context and situation she was placed. Normally, when reinforced positively by her mother, these words got established in her verbal repertoire in no time. The vocabulary of around 45 to 50

words is given in the appendix.

The section below discusses the acquisition of vowels and consonantal sounds one by one as they develop in Neha's speech from the age of six and a half months till 15 months of age.

VOWELS : Vowels are present in a child's speech right from the birth cry. Earlier studies also report the first utterances of child as vowels of some sort. Spectrographic study by Kostic (1971) also reveals that first utterances of child are vowels though inspiration and expiration are intermingled as child tries to establish its breathing pattern. Very soon the two are separated and the expiratory current begins to carry the phonated air stream. We can call these first few utterances / cries of the baby as "vowels of some sort" till the phonated air stream is entirely expiratory, though high pitched and highly sonorous but free of phonated inspiration. Observations in support of this are presented by Taine (1876), Preyer (1893), Tracy (1893), Blanton (1917), Gesell (1925), Bean (1932), Shirley (1933), Lewis (1951), Irwin (1941) and Lynip (1951).

The earliest utterances of Neha were also vowels though we can not specifically say which vowels; as we do

not have recordings of her utterances before 6 months.

At the age of 6 1/2 months following vowels were present in Neha's speech [a], [i], [u], [o], [e], [ɛ]. From the recording, it was observed that [a] was the most frequent vowel from the age of 6 and a half months even till today though other vowels were present in her speech but articulated less often than [a]. Another significant aspect noticed in her speech was that vowels differed in their quality as compared to adult's utterances. Lynip (1951) in his spectrographic' study of an infant also states that although their is a similarity in production of vowels, yet there is a lack of clarity in the infant's utterances as they keep changing and modifying their oral structures which hence change the quality of vowels produced.

Some other observations in the acquisition of vowels by Neha are as given below

1) Most of the vowels produced by her were long and nasalised like [ã], [ũ], [ẽ] etc. The vowels were sometime also accompanied with humming sounds like `əmm', `umm ' till around 8 months of age.
s

2) It was observed that Neha always produced one vowel in a single breath like [aaaa] or [oooo] but never attempted something like [aaoi] till the beginning of

the ninth month. The other utterances produced by her after this period were [ita], [iba], [iiia], [ooa], [yai] etc. along with the earlier vocalizations. During this period she also started communicating effectively by imposing various intonations on vocalic utterances. For examples to seek attention her vowels was long nasalized [a].

3) [i] vowel though present at the time of data collection was not produced often. [i] was used frequently only after 10 months so it was non-recurrent in the initial stages.

4) Vowel [ɔ] was observed in one of her utterances [bɔ] for [bɔl] `ball' which she produced at the age of 12.5 months.

5) Neha vocalized differently to express her fear, displeasure, excitment etc. Surprisingly, she used different vowels to express different emotions.

6) Vowel [u] was present in one her utterances [mu] for /mun/ which she uttered at the age of 13.1 months.

7) Most of the earlier words produced by her around 12-13 months of age were mainly consisting of reduplicated syllables with [a] used morefrequently

than others like [mama], [papa], [dada] etc. Most of words in her vocabulary also has predominence of vowels. The list of words acquired by her given in the appendix.

Consonants

[m] : The first consonant noticed in her speech was a bilabial nasal [m]. This was already present at the time of the beginning of data collection. This sound appears when the child while vocalising, closes her lips while uttering a vowel sound. The utterances produced at 6 1/2-7 months were mostly [əmm] or [umm]. It was also noticed that [m] was the most frequent consonant used. Sometimes it was also produced in anticipation of feeding like [m mm mm] etc. The utterances consisting of [m] are as given.

[məm] /məm/ (water, overextended for liquids), [məmmi] /mə mmi/ (mother) [aam] /aam/ (mango, overextended for fruits). Some of the scholars also report bilabials which have been said to form naturally by labialisation of vowels in the utterances of the infants as the first consonants to appear. Schultze (1880) stated that infants phonetic utterances evolve from bilabial phenomenon to sounds requiring guttural sounds. Irwin (1941) considers that the pre-eminence of the labial phenomenon marks the beginning

of the cortical functioning and the approach of the period of imitation. Lewis (1951) states that child produces [m], [n] etc. in anticipation of feeding, but he points that back consonants appear earlier than front consonants.

[h] : [h] was the next sound to appear in Neha's speech. This was usually observed when she laughed loudly in response to tickling. [h] probably was also there before the recording of her speech but was noticed in recordings at the beginning of the seventh month. Irwin and Curry (1941) in their study reports [h] as one of the earliest sounds. Gregoire (1947), Mccarthy (1952) and Shohora (1935) also stated that [h] appears early when the infant is establishing breathing and when he is learning to suck and swallow, Lewis (1951) also gives an explanation of the early appearance of the [h] sound which he says, "is the sound heard if the voice is momentarily withheld in the art of breathing". Writers reporting [h]as one of the earliest sounds are Blanton (1917), Fenton (1925), Bean (1932) and Shirley (1933). [h] was noticed in Neha's speech in following utterance [haha], [hihi], [ihiihi], [hɻhɻ], [hae], [hat], [əha], [hɑt̪] etc.

[n] : [n] was noticed in Neha's speech between the 2nd and 3rd week of the seventh month in articulations [ə n ə n ə nn] etc. [n] in this articulations was more palatalized than

dental. The tongue seem to be touching the alveolar ridge in her articulations like [ɔɲə] [əɲəɲɲə] [ənɻ], [na], [nana] etc. [n] though present and found in the earlier period was not produced very often in her babblings. It was around 12-13 months of age when she uttered [nana] /nana/ meaningfully. /nani/ was uttered by her around 14 months of age though she comprehended `nana', `nani' correctly by pointing at them when asked to. Other utteranced produced by her after one year of age were [nə̃i] `no'/`don't', [nai-nai] `to bathe', [no-no] `no'/`don't', [ninni], `to sleep', etc.

[y] : The semivowel [y] was also reported during the same period in Neha's speech when [n] was being acquired. This was always felt that Neha produced the sounds accidentally, and it was only later that she consciously made an effort to produce the sound when asked to; or on her own. [y] was found more in her reduplicated babbling stage when she produced mainly [yayayaya]. [y] though observed in her speech as early as 7th month but was non-recurrent. It was noticed in the following words articulated by her [nyani] for nani. She started comprehending `ye' for `this' but produced `je' and never `ye'. [y] was also seen in her crying and fussing sound along with nasal.

[g] : [g] in Neha's speech also came in the 3rd week of

the seventh month when she responded to the command /neha gə ɾ gəɾ kəro/. At the beginning, she used to do this while having some liquid and later on she attempted it without the liquids also. This sound was voiced, and produced at the back of the mouth, not at the velar region, but guttural. This sound was not anywhere close to [g]. [g] was again a nonrecurrent sound and appeared later at around 14-15 months of age, when she articulated following word

[gi] for /gir/ `fell down'

[giya] for [gəya] `gone'.

During cooing also, something like agu was noticed but the recordings are not there to confirm the presence of sound. Whereas gəɾ gəɾ came very spontaneously to her. She also used to gurgle when playful.

[b] : [b] was noticed in one of her utterance[ab a] at the beginning of the 8th month. This was also observed when she used to play with her lips making repetitive movements. [b] was present during babbling stage when she uttered [baba], [ababa], and later on in [abiya], [bɔbɔ] etc.

The words produced by her were [baba], [bɔbɔ], [bebi], [biya], [bəya], [bʊa], [bɑ] [bɬ] etc.

[p] - [p] was noticed in the first week of the eight month, again seem to be articulated spontaneously. The sound once observed in her speech was then reinforced by

her mother so that the sound gets established in her repertoire. It was seen that the sounds which were not reinforced eventually got lost and came after a long time. [p] was noticed in her utterances like [apa], [papɨ], [papi], [papəi], [papaji], [pi] etc.

[d] : [d] was the sound noticed in her recordings in the second week of the eighth month. It was very difficult to decide upon the place of articulation as in the case of consonants also, child is constantly modifying the shape of the vocal tract and tongue is also making the contacts at different points of articulation while the child is experimenting with the sound. As the tongue is large in relation to the oral cavity, the tongue blade may close against the alveolar sidge but also be resting against the lips which are partially closed around it. Probably the sound produced is intermediate between those of bilabial and alveolar consonants of adult speech. The most frequent utterance during this period was [dada]. Another significant development during this time was that Neha began to impose various intonations on her speech to express anger, excitement, displeasure etc. Also Neha started communicating by means of gesture for reaching, pointing, grasping and rejection.

[t] : Voiceless [t] was observed in her speech after she

acquired the voiced counterpart. [t] seem to be articulated from the same place of articulation as [d]. [t] was one of the frequent consonant observed in her babblings like [ata], [tata], [ita]. Sometimes the articulations were babbled strings sounding like jargon speech for e.g. [tatapap^{h}u] etc. /l/ as in /lait/ was substituted by Neha as [tait] (one of her early utterance). She usually substituted the difficult sounds by the ones she had already acquired.

[j] : [j] was noticed in her speech when she articulated [aja] while imitating the adult's speech though this was not meaningful in her speech initially. The front part of the tongue seem to be touching the edge of the upper front teeth as in post dental areas. Sometime [j] was substituted by voiceless [c] in later period. Other utterances were [jɻjɻ], [j̊ə:y], [aja].

[k] : [k] was noticed in Neha's speech when she articulated [kaka] which was reinforced by her parents. She got fascinated by [k] so much so that for some period of time, her only articulation was [k]. [k] was articulated mostly when she was happy and playful. [kaka] was comprehended by her quite early for `children' and she started using it meaningfully around 12-13 months of age. During this time, one of her other utterance was [ka] for `eat'/`I want to

eat'. Sometimes it was felt that the initial [k] was slightly aspirated in [kaka]/[kaki].

[c] : [c] was noticed in Neha's speech when she articulated [c] spontaneously in [ə́ca], [caca]. In the articulation of [c], tip and the blade of the tongue seem to be making contact with the alveolar ridge. Though not articulated very frequently during babbling, [c] was noticed in her speech in the following utterances meaningfully around 13-14 months of age. [cae] - `tea', [ciya] - `bird', [ciji] - `any eatable'.

However after describing the sounds acquired by Neha throughout the period of eight months, an important point to notice is that though there is a `similarity' of child utterances to adult sounds, yet they were definately lacking in clarity. This can be attributed to the differences in size and shape of the articulating mechanism of the child and of the adult.

ASPIRATION : Aspiration was observed in her speech around 9-10 months of age when she articulated [pap^{h}u] where [p] was slighly aspirated. Later on aspiration was also seen in voiceless alveolar and palatal sound like [t^{h}] and [c^{h}] but not in the voiced once like [b^{h}], [d^{h}] and [j^{h}] [P^{h}] was also noticed in utterances like [p^{h}u] for /p^{h}uɭ/

`flower',. Palatal voiceless aspirate [$c^h$] was noticed around 12 months of age when she initated /aɲc$^h$i/ `sneezing' as [aic^h]alveolar aspirate [t^h] was noticed after one year of age in

[hath] for /hat^h/ `hands'

[t^ho] for /thro/ `throw'.

Retroflexion : Retroflexion was observed in Neha's speech around 13 months of age when she imitiated her father and uttered /tiktik/ for `watch'. This was also observed in her other utterances like /tutu/ for `anything broken'. /t y/ `toy'. Retroflexion was not observed in sounds other than [t] till 15 months of age. The back of the tongue blade seem to be making contact with the palate beyond the alveolar ridge, approximating adult's utterance.

The consonantal sounds presents in Neha's speech are [m], [p], [b], [t], [d], [n], [c], [k], [p^h], [t^h], [c^h], [ɲ], [g], [ṭ], [y], [h].

The consonantal sounds presents in Prachi's speech are [m], [p], [b], [t], [d], [n], [c], [k], [p^h], [t^h], [c^h], [ɲ], [g], [ṭ], [y], [h], [l], [ṛ].

First Word : The first use of sound with meaning is usually considered to constitute the child's first word. It is very difficult to determine the exact age at which the child uses his first word. Sometimes the early babblings of the

child, coinciding with the presence of certain person or objects are thought to be child's first word. Lewis (1951) states `To discover how reference develops, we have to notice, by considering the child's behaviour at times when he is speaking or responding to words, what is the function of a given sound group both before and after he first appears to attach it to a given object. In other word, we have to judge the meaning of a word by noticing its place in the child's activity'.

The first words of Neha appeared around 11-12 months of age. At the age of around 1 year, Neha had a vocabulary of 2-3 words [məmmi], [papa], [kaka]. It was found that her first word consisted of sounds already present at an earlier stage of development. This has also been discussed by Clark & Clark in the issues on theory of language acquisition in introduction (p.2). Each of these words were positively reinforced by his parents and used often so that she consistently uses the same referent for same person. In Table 1 given in the introduction (p.7), only two of the authors, Shirley (1933) and Cattell (1940) have assigned the age level to the stage of linguistic development characterized by the use of single word. Cattell places it at 11 months whereas Shirley places the age of first word as 14 months. Most of the studies though report that the first word actually does occur short before the end of the

first year. There is also a striking agreement in regard to the form of the first word. The first word of children are usually a m onosyllable or a reduplicated m̥nosyllable such at bye-bye, papa, mama, kaka, dada etc. The onomatopoeic words also appear early in a child's speech like bʰo bʰo and miau-2. The first words are usually used in isolation and function as one word sentences. Neha's hoophrastic utterances and their meanings have been produced in the appendix. It was also observed that she expressed her feelings, and needs through the first words. Another significant aspect was also noticed that Neha in these words dropped sound which she had not acquired. Ferguson & Farwell (1975) mentions `salience and avoidance' as a characteristics of early phonological development. In our study, we observed that both Neha and Prachi were producing words with sounds that were more familiar to them and avoided others. Pye, Ingram and List (1987) also report that sounds heard more frequently are acquired earlier. Prachi and Neha also acquired sounds like [m], [p] earlier than [bh] [dh] [l] etc. which were used less frequently. After the appearance of first few meaningful utterances, Neha picked up words used in everyday situation with an amazine speed. The list of vocabulary at the age of 15 months is given in the appendix. The acquisition of individual sounds and early language development of Neha is reproduced below in Charts A to I.

CHART (A)

Age (Month Week)	6.3	6.4
Sounds	[a], [I], [u] [ɤ], [ɛ], [e], [m],	[ɔ], [o]
Words A. Comprehension	a) She started responding to her name 'Neha'. b) She started noticing sounds in her environment.	
B. Production	a) She mainly produced cooing sounds like [ma ma mam] etc.	
Notes & Remarks	1. She started sitting. 2. She enjoyed playing with noise making toys. 3. Neha produced mainly long vowels, usually nasalised such as [a], [e], [i], [u]. 4. She also accompained vowel sounds with humming to produce [əmm], [Umm] etc.	

B.

Age (Month Week)	7.1	7.2	7.3	7.4
Sounds	[h]	[h], [n], [y]	[g]	[b]
Words A. Comprehension	a) /neha gər gər karo/ (g was articulated during gurging, /neha jhat/, /neha dhəm/, /neha dhəmkaro/			
B. Production	a) vocalization observed like [aaa], [oo], [aa], [ɬɬ] etc. b) [mməmməmm], [ɻɻɻɻ], [ihihi].			
Notes & Remarks	1. Sitting achieved. 2. She enjoyed playing with noise making toys. 3. She self-initiated babbling on her own. 4. [h] was most commonly observed while laughing loudly, as in [ihi] [hihi], [hɛhɛ] etc, [n] and [b] were articulated rarely; [g] was observed only during gurgling; [y] was also observed while cooing [yayayaaa]. 5. She became alert and active. 6. She enjoyed going out doors and started pointing to door.			

C.

Age (Month Week)	8.1	8.2	8.3	8.4
Sounds	[p]	[d]	[t] [j]	
Words A. Comprehension	In addition to what is reported in 7.1-7.4, a) Neha started clapping /klæpiŋkarə/ b) She strated pointing at fan by looking upwards.			
B. Production	a) Vowels still predominated in her utterances [aaae] [hahaai] [aaay] etc. b) [d] and [t] were more palatalized than dental. c) Intonation also became important to convey meanings. d) Sometimes she also produced utterances like [atatap phu]. e) Sometimes, litte aspiration was noticed in bilabial voiceless [p].			
Notes & Remarks	1. Neha enjoying creeping with her stomach, flat on the floor. 2. Squealing was observed. 3. She used to yell loudly for calling & seeking attention. 4. She also enjoyed tickling.			

D.

Age (Month Week)	9.1	9.2	9.3	9.4
Sounds		[k]	[c]	[ph]
Words A. Comprehension	Neha responded to a) Bye-Bye and anticipated that someone'll pick her up. b) [nɔ̃], along with what has been reported earlier. c) Gurgling activity was reduced now.			
B. Production	a) Repectitive babbling was more. b) It seemed that Neha paid attention to utterance and started establishing relationship between sound and meaning. c) Variation in intonation pattern observed to express different emotions and different needs. d) Different utterances produced were [aja] [aca] [abababa] [paphu] etc. e) She also showed annoyance at not being able to reach an object.			
Notes & Remarks	1. Neha started crawling and standing with support. 2. She enjoyed moving about in walker and vocalized when happy. 3. She still enjoyed tickling and playing /jhat/ /'Peek-a-boo'/.			

E.

Age (Month Week)	10.1	10.2	10.3	10.4
Sounds	aspiration	noticed		
Words A. Comprehension	a) She comprehended familiar persons in the environment by their referents like /mɑmma/, /papa/ though not consistenly. b) Started comprehending /ʃɛʃɛ/ c) /b)b)/ for dɔgi and `over extension' was observed as she used /b)b)/ for all animals.			
B. Production	a) Babbling reduced considerably. b) The sounds produced earlier were not articulated by her now though they were established already. c) Again, Intonations were imposed variously on vowels to mean different things. d) She used to scare us by changing the pitch from high to low.			
Notes & Remarks	1. She tried to walk by holding on to furniture by the end of ten months. 2. She used to get fascinated by electric switches. 3. /hɑmma/ was the stimuli in response to which she used to dance. /neha hɑmma kɑro/. Catchy music attracted her. (hɑmma was picked up from the `hɑmma-hɑmma' song from the film Bombay).			

F.

Age (Month Week)	11.1	11.2	11.3	11.4
Sounds				
Words A. Comprehension	a) Neha started understanding simple instructions and identified pictures in book.. b) She started comprehending and recognized familiar person names like [dada], [papa], [nani], [bʱa] etc, though not very consistently.			
B. Production	a) [Ka ka] was the most frequent utterance produced by her during this period. b) [məmmi] was uttered to refer to everything in her surroundings, though she looked at her mother when asked 'məmmi kahan hɛ'. At this stage, she over extended the meanings of the words present in her vocabulary. c) /papa/ initially refered to general class 'males'.			
Notes & Remarks	1. She started standing without support. 2. Overextension in meaning was noticed in her utterances. 3. She comprehended much more than she could actually produce.			

G.

Age (Month Week)	12.1	12.2	12.3	12.4
Sounds	Retroflexion	observed		
Words A. Comprehension	She used to understand following instructions a) /dudd^{h}u pina hɛ/ - usually responded by saying m m. b) /neha ne bahər jana nɛ] started to point out to the door etc. c) She used to obey following command /ṭɔy ko ninni kəra do/, /ṭɔy ko hat kər do/, /ṭɔy ko pari kər do/, /neha jɛ jɛ kəro/, /neha khəre ho jao/, /neha bay kəro/, /neha aa jao/ etc.			
B. Production	a) During this time, significant development in vocabulary also observed. b) She produced following words meaningfully. [papa], [bɔbɔ)], [məmmi], [bɔa], [dada] was used to refer to both [dada] and [dadi]. Similarily [nana] was used to refer to both [nana] & [nani] i.e. CVCV$_1$ was not attempted.			
Notes & Remarks	1. She started walking with support. 2. She enjoyed watching pictures in the book. 4. She played more with Cubes and stacking toys. 5. She enjoyed handling things on her own. 6. Retroflexion was noticed in utterances given below. [ṭik ṭik] - `watch' [ṭɔy] - `toy'			

H.

Age (Month .Week)	13.1	13.2	13.3	13.4
Sounds				
Words A. Comprehension	a) She recognized familiar pictures in the book and pointed correctly when asked to. b) Some of the new commands she comprehended were /neha ka hred kahã hɛ/ /neha ke tith kahã hɛ/ c) Words were used as holophrases by her.			
B. Production	a) Some of the new utterances in this period [cae] /cae/ `tea' [cay-2] /cay-2/ `tea' [hɛd] /hɛd/ `head' [tith] /tith/ `teeth' etc. b) Sometimes, she used to combine words like /m mmi, m m/ for `mummy, I am thirsty', `Mummy, I want water', /papa, ba / for `papa, I want to go out'.			
Notes & Remarks	1. She started walking unassisted. 2. During this period, it was noticed that when told /papaji bolo/, she creatively used `ji' for dog and `uttered [bɔbi] for /bɔbɔ/. 3. Her ulterance `papa' went through a series of modification as given [paphu] - [papa] - [papɔl] - [papaji]  4. Jargon speech was noticed.  5. Words were used as `holophrases'.			

I.

Age (Month Week)	14.1	14.2	14.3	14.4
Sounds				
Words A. Comprehension	a) Neha used to comprehend most of the verbal commands in everyday situations like /aa jao/, /baith jao/, /ciji khalo/, / neha ne nai kərni h /, /bahər jana hɛ/ /khɔre ho jao/ etc. b) Comprehension increased manifold as she sometimes responded to commands which were thought to be 'new' for her by parents.			
B. Production	a) At this stage, she tried to imitate words produced by her parents and modified utterances to her convienience. She dropped the difficult sounds which were not acquired by her. b) The list of meaningful words produced by her is given in the appendix.			
Notes & Remarks	1. She started using language creatively in new situations depending on her cognition. 2. Most of her expressions were spontaneous and voluntary. 3. She used to imitate the motor actions of other people in her surroundings. 4. She also made an extra effort to please other people, especially her parents and repeated actions which she thought would make her parents happy.			

CHAPTER V

SUMMARY AND CONCLUSION

As discussed in previous chapters, speech and language acquisition by native children which seems so natural and spontaneous to happen has always fascinated psychologists, linguists, neurologists and psycholinguists since ages. Though many studies have been conducted in this area by various scholars, one of the most important works so far has been that of Roman Jakobson (1941). His theory of phonological universals remains as the most well known theory so far about language universal. He emphasized that language producing skills may be viewed as occurring in a sequence of stages each of which is relatable to its preceding stages in a coherent way. He further said that the phonemes which are used rarely in the language are acquired later by children.

Different scholars have also persued the studies of language acquisition depending on their individual interests, and these studies dates back to well over hundred years. The most earliest studies done in this area were carried out by parents, who got interested in the language acquisition of their own children and collected data in the form of "dairies" or "baby biographies". The

diaries consisted of notes on the utterances and language development of their children. These studies are of enormous importance as they still serve as a source of data for other studies. These diary studies though continue till today but a major shift in methodology was seen after the World War I. The focus shifted from the earlier trends in structural linguistics on one hand to behaviourist theories of learning on the other. Trends also changed from longitudinal to cross-sectional. The studies during this period were done on large number of subjects, and focused on particular behaviour acquired at certain ages. Further, in later half of the twentieth century, a shift was again observed from a cross-sectional to longitudinal studies, which, is referred to as `longitudinal sampling' by Ingram.

The present study is also longitudinal, carried out on two infants, aged 6 1/2 months and 9 months respectively to note down the acquisition of speech sounds and early language development. Some of the few questions taken up in this study are to observe/examine what syllabic combinations appear earlier than others in child's speech. Also, whether vowels or consonants appear first. This study also tries to investigate if the acquisition of sounds is gradual or abrupt. Which of the sounds acquired earlier by child are recurrent or non - recurrent. Which

one of the sounds occurs more frequently than others. The study also takes into account the stages at which the child starts assigning meaning to words. The major portion in this study is also devoted to (macrolinguistic) overall of language development of these two children.

To examine the above hypothesis, the present study on two subjects, Neha and Prachi, aged 6 1/2 months and 9 months was conducted for a period of around 8-9 months. As Neha is the daughter of the researcher, the data obtained from her was extensive and examined closely to find answers to the above questions. The second subject Prachi is three months older and hence the data from her was helpful in indicating the direction that the younger child's development will probably take.

The data was obtained by providing verbal stimuli and nonsense syllables to elicit response. In the later stages, the response was obtained mainly by imitation. The utterances were recorded approximately every six to ten days. These recorded responses obtained from the subject were then careful transcribed in phonetic transcription to note down the sequence of different sounds acquired at different age levels. At later stages of recording, the meaningful utterances and words were noted down carefully and analyzed for phonemic patterns if any. The words and

utterances of the child have been reproduced in the appendix. The charts were made to note down the acquisition of sound at different age levels and significant language development if any. The major section of chapter IV is also devoted to study the overall (macro-linguistic) language development.

Major findings of this study are summarised as below: The first sounds of the new born infant are the "cries' from which speech develops. Birth cry is the first time when child hears the sound of his own noise/voice and perhaps begins to correlate the relationship between speech (articulation) and audition. Very soon the relationship between articulatory activity and audition is established. Acquisition of sounds is gradual and not abrupt, both in vowels as well as consonant.

Vowels are the earliest sounds to appear in both the cases and predominated throughout the early months of life in terms of frequency of occurrence. The most frequent vowel observed in Neha's speech was [a]. The vowels usually produced were long and nasalised such as [$\tilde{\bar{a}}$], [$\tilde{\bar{i}}$], [$\tilde{\bar{u}}$], etc.

The first occurrence of all the sounds including these vowels were uncoordinated and precision was gained

gradually, varying between correct and incorrect sound for sometime.

[ɔ] and [u] were articulated less frequently than others.

Though speech and language cannot be separated from each other at any point of time yet recordings reveal that Neha started communicating effectively around 7-8 months of age when she started imposing different intonations on her utterances to express different meanings. Squealing, growling and yelling was also observed during this time. The combination of syllables began as in reduplicated babblings.

A pattern of alternate speaking and hearing seem to be set up in the repetitive babbling stage of Neha.

Babbling reduced in frequency around nine months of age when she started paying attention to the relationship between sound and meaning.

It was also observed that Neha's vocal response to adult speech normally consisted of her own familiar sounds.

As far as consonants are concerned, the first to appear was a bilabial nasal [m]. Other observations regarding consonants throughout her speech development are aspiration was noticed around 10 months of age more in voiceless

sounds like [p^h], [t^h], [c^h]. Voiced consonant appeared ealier than voiceless. Retroflexion was noticed around 12 months of age only in [t]. Trills, Fricatives and Laterals were not acquired by Neha until the age of 15 months.

It was noticed that most of the words uttered by Neha at 15 months of age had more vowel elements and only about half of the consonants in the total phonemic inventory of Hindi. Some consonants though present in Neha's speech were dropped in the articulation of words. She usually simplified CVCV combination and dropped either the initial or the final consonants. But these consonants do appear at one time or another, at one position or another.

The words acquired by Neha were first used in generalized sense and it was quite later that word was understood in relation to a specific referent.

It was observed that Prachi though less vocal around one year of age, probably, due to her fascination for walking picked up words very fast around 16-17 months of age. She had vocabulary of around 45-50 words at 1.6 years of age. Prachi also acquired [l] and [r] which was not present in Neha's speech until 15 months of age.

The salient features of the speech and language development of child under 1.3 years, as observed in the two cases under

study are summed up below.

1. The first sounds of the newborn slowly develops into speech.

2. Vocalisations are used as means of communication before words proper are used.

3. Comprehension appears before the use of words.

4. The normal child has a repertoire of a very few words by one year of age.

5. Development is slow in the first months of the second year and the new words are added with an amazing speed only around 18 months of age.

6. Words are first used in a generalised sense and their use for specific meanings is a developmental process.

7. Noun words appear first.

8. First words are usually used as `holophrases'.

9. Combination of words appear later than one and a half years of age.

10. The acquisition of individual sounds and language development are summarised in the charts below :

CHART J.

	SOUNDS	COMPREHENSION	PRODUCTION
6	[m]	a) She responded to her name and started noticing sounds in her environment.	a) Cooing sounds [mɔmmɔm] etc/
6.5		b) Vocalisation observed.	b) [ɔ nɔ], [nɑnɑ] etc.
	[h]	c) Babbling self-initiated.	c) [baba], [papa], [kaka], [api], [yaya]
7			
	[n]	d) Comprehended simple actions	
	[y]	like /jhat karo/ /klɪpin karo/	
7.5		e) Intonation imposed on	
	[g]	vocalisation to convey	
	[b]	meanings.	
8			
	[p]		
	[d]		
8.5			
	[t]		
	[j]		
9			

CHART K.

SOUNDS	COMPREHENSION	PRODUCTION
9	a) Babbling reduced.	a) Many new utterances observed like [ita], [atatai], [pap^{h}u] etc.
9.5		
[p^{h}]		b) She expressed various emotions by vocalic utterances.
10	b) Sound meaning relationship established around this time.	
[t^{h}] [c^{h}] aspiration		
10.5		c) Most of the words produced were nouns or onomatopoeic like [papa], [bɔbɔ] etc.
	c) Comprehension increased manifold in	
11	(i) Simple instructions. (ii) Onomatopoeic words. (iii) Referents	
11.5		
	d) Over extension in meaning was observed in the usage of words.	d) Most of the words produced were used in a generalised sense.
12		

CHART L.

SOUNDS	COMPREHENSION	PRODUCTION
12 Retroflexion [t] 12.5 13 13.5 14 14.5 15	a) Neha started comprehending most of the simple instructions in every day situations. b) She comprehended names /referents of familiar persons. c) She also identified her body parts head, nose etc.	a) Neha produced utterances like mummy, papa, dada meaningfully. b) She tried to imitate words spoken by her parents and dropped difficult sounds which she did not acquire c) She used language creatively in new situations. d) Language became indispensable for her.

To conclude, it can be stated that there is a fixed developmental sequence in the acquisition of speech sounds by children, though individual variations are present depending on various other factors influencing child development.

BIBLIOGRAPHY

Bellugi, U. and Brown, R. (1964) `The Acquisition of Language', Monographs of the Society for Research in Child Development-29.

Beg Mirza Khalil, A. (1991) Psycholinguistics and Language Acquisition,Bahri Publications, New Delhi.

Brown, R. (1960) A First Language: The Early stages, Cambridge Mass: Harvard University Press.

Carrol, J. B. (1960) `Language Development in Children in Sol. Saporta(ed), Psycholinguistics - A Book of Readings, (pp 331-342), Holt, Rinehart and winston, New York.

Chomsky, N. & Halle, M. (1968) The Sound Patterns in English, Harper and Row Publishers, New York.

Ferguson, C. A. & Slobin, D.I. (1973) Studies of Child Development, Holt, Rinehart and Winston Inc., New York.

Ferguson, C. A (1979) `Phonological Development' In, Fletcher and Garman (eds.) Language Acquisition.

Gleason & Gill (1972) A Start in Punjabi, Punjabi University Press, Patiala.

Holenstein, E. (1976) Roman Jackobson's Approach to Language. Indian University Press.

Ingram, D. (1979) `Phonological Development' in P. Fletcher and N. Garman (eds) Language Acquisition.

Ingram, D. (1989) First Language Acquisition, Method, Description and Explanation Cambridge University Press, Cambridge

Jakobson, R. (1941/68) Child Language, Aphasia and Phonological Universals. The Hague: Mouton, Translation by R. Keiler of Original German Version of 1941.

Jakobson, R. and Halle, M. (1981) `Phonemic Patterning' in Sol Saporta (ed.) Psycholinguistics - A Book of Readings (pp. 346-48). Holt, Rinehart and Winston, Inc., New York.

Kostic, R., Mitter, A. and Rastogi, K.G. (1975) A short outline of Hindi Phonetics - Publishers Indian Statistical Institute of Calcutta.

Kostic, R. (1971) Speech and the Hearing Impaired Child (pp. 23-31), Publishers - Indian Statistical Institute of Calcutta.

Ladefoged, P. (1971) A Course in Phonetics - Harcourt Brace Jovanovich Publishers.

Leopald, W.F. (1961) `Patterning in Children's Language Learning'-in Sol Saporta (ed.) - Psycholinguistics - A book of Readings (pp. 350-58) - Holt, Rinchart and Winston Inc., New York.

McNeill, D. (1970) The Acquisition of Language, (pp.130-141), Harper and Row Publishers, New York.

Mccarthy, D. (1954) Language Development in Children (pp. 492-630) In Carmichael L. Manual of Child Psychology (2nd ed) Wiley Eastern Pvt. Ltd.

Mussen, P.H., Conger, J. J. & Kagan, J. (1974) `The Development of Language' (pp. 233-266) In Child Development and Personality Harper international Ltd., Harper and Row Publishers, New York.

Miller, W & Ervin, S. (1964) `The Development of Grammer in Child Language' (pp.9-34) In Bellugi and Brown.

Narang, V. (1984) Communication of Situation Time in Hindi, Garimashri Publishers, New Delhi.

Oller, D. K. (1980) `The Emergence of Speech in Infancy' - Grace H., J. F. Kavanagh and C.A Ferguson (eds) - Child Phonology Vol. I (pp. 93-112), Academic Press.

Smart, M. & Smart R. (1972) Children Development and Relationship (pp.241-270) 2nd ed. McMillian Company, New York.

Smith, P. & Cowie, H. (1988), In Understanding Children's Development, Basil Blackwell.

Smith, N.V. (1973) The Acquisition of Phonology : A Case Study Cambridge : Cambridge University Press.

Stott, C.H. (1967) Child Development : An Individual Longitudinal Approach Holt, Rinehart & Winston, New York.

Stark, R.E. (1979) `Prespeech Segmental Feature Development', pp. (149-60), Fletcher, P. and Garman, M. (eds). In Language Acquisition.

Stark, R. E. (1980) `Stages of speech Development in the First Year of Life, (pp.73-92) - Grace H, Kavanagh, J.F. and Ferguson, C.A. (eds.) In Child Phonology, Vol. I, Academic Press.

Straight, H. S. (1980) Auditory Versus Articulatory Processes and their Development in Children-Grace H, Kavanagh, J.F. and Ferguson, C.A. (eds.) - In Child Phonology Vol. I pp. Academic Press.

Velten, H. (1943) `The Growth of Phonemic and Lexical Item in Infant Speech' (pp.281-92) In Language 19.

Chandra, Tulika, (1994) M.Phil dissertation on `The Phonological Development in Bilingual Children : The case of Hindi and Punjabi Bilinguals', Centre for Linguistics and English, School of Languages, JNU, Delhi.

Gupta, Meenakshi, (1993) M.Phil dissertation on `Acquisition of Fricatives and Affricates in Hindi', Centre for Linguistics and English, School of Languages, JNU, Delhi.

APPENDIX

SECTION - A

Verbal Stimuli

The verbal stimuli usually provided to Neha was in the form of `baby talk' in which words were modified and intonations variously imposed to elicit responses from her. Sometimes the stimuli was build upon her cooings and babblings. Nonsense syllables were also used. Mostly, the pitch was raised and vowels lengthened in these utterances. Facial expressions, eye movements and gestures also played an important part in eliciting responses from her around 6-8 months of age. Later, her reduplicated syllables were used as stimuli and used alternately as during communication, to record her responses. New words of everyday situations were also introduced repetitively along with the gestures and other facial movements. Later around 11-12 months of age, books and toys were also used as stimuli to evoke responses from her. Some of the utterances used as stimuli were `aaha', `bho-bho', `miau miau', `kaka', `baba', `dada', `nana', etc. etc.

Neha's holophrastic utterances and meanings attribute to them.

Utterances attributed	contexts	Meaning
[ba]	points out to the door	`I want to go out'.
[bɔbɔ]	usually when seeing a dog or when dog barks	
[hɔt̤]/[ɔt̤]	when discovers anything hot by touching	`It's not'.
[no]/[nai]	when asked to do something against her will;	`I don't want to do this'.
[papa]	when her papa comes home, or goes out, or when she has to go to papa, Here I would like to point out that papa was uttered with different intonations to express different meanings. Similarly [m mmi] was also used differently in different contexts to express different meanings	`papa has come' `papa is going' `papa, I want to come' papa, I want this etc.
[məm]	When she is thirsty/ hungry. She used to get impatient and raised her voice when her needs were not met immediately.	`I want milk' `I want water'
[ninni]	lying on bed or when she wants to sleep. She used to sing her lullaby by uttering [ooo] like sound.	`I want to sleep'.
[ka]	when she wants to eat something	`I want to eat this'.
[aapi]/ [aapɐ]	when she wants to do things on her own.	`I'll do it myself.
[dada]	when seeing dada's photograph	`This is dada'
[hat̤]	when wants some one to get away.	`you get away'.

Comprehension

a) used to respond correctly to
(i) neha, məmmi kahɛ̃ hɛ ?
fɛn kahɛ̃ hɛ ?
papa kahɛ̃ hɛ ?
kaka kahɛ̃ hɛ etc.
(ii) neha ka hʷd kaha h ?
neha ne ■ məm/ pina hɛ ? etc.

b) used to obey the following verbs :

(i)	/aa jao/	`come'
	h h	
(ii)	/bait o/bait jao/	`sit'
	h	
(iii)	/kəṛi ho jao/	`stand up'
(iv)	/ninni kəro/	`sleep'
(v)	/nainai kəro/	`take bath'
(vi)	/gəṛ gəṛ kəro/	`produce gurgling sound'.
(vii)	/lɛ̈t jao/	`lie down'
(viii)	/danci kəro/	`dance'
(ix)	/pari kəro/	`kiss'
(x)	/cəlo/	`walk'
(xi)	/jɨjɛ kəro/	`pay respect/fold you hand
(xii)	/klʷepiŋ kəro/	`to clap'
(xiii)	/nəməste krvo/	`fold your hands'
(xiv)	/bayʲ kəro/	`say bye - 2'
(xv)	/hath milow/	`shake hand'
(xvi)	/mat kəro/	`don't do' etc.

SECTION-B

NEHA'S VOCABULARY AT THE AGE OF FIFTEEN MONTHS

Child's utterances	Adult's utterances	Meanings.
A. PERSON		
[məmmi]/[məmmiji]	/məmmi/	'Mother' 'Mummy'
[pəpa]/[pəpaji]	/pəpa/	'Father' 'papa'
[dada]	/dada/	Paternal grandfather 'dada'
[dadi]	/dadi/	Paternal grandmother 'dadi'
[nana]/[nana]	/nana/	Maternal grandfather 'nana'
[nani]/[nani]	/nani/	Maternal grandmother 'nani'
[bəa]	/bua/	Aunti 'bua'
[biya]/[bəya]	/bʰəiya/	'bʰaiya'/'boys'
[kaka]	/kaka/	'children'
[bebi]	/bebi/	'babies'
B. BIRDS/ANIMAL.		
[ciya]	/cirya/	Sparrow (for birds).
[bɔbɔ]/[bɔbi]	/bhõ - bhõ/	'onomatopoeic for dogs' (over extended for animals)
[miã - miã]	/miaũ - miaũ/	'cats'
C. FOOD ITEMS.		
[aam]	/aam/	'Fruits' generally
[məm]	/məm//pani/	'water' 'Liquids' generally
[kiji]	/ciji/	'eatable'
D. ACTION WORDS.		
[ɲinni]/[ninni]	/ninni//nĩd/	'sleep'
[ɲai-ɲai]/[nai-nai]	/nʰai - nʰai/	'to bathe'
[ɲo-ɲo]/[nəi]	/no//nəĩ/	'no'/'don't'
[ba]	/bahər/	'I want to go out'

E. OTHERS

[bɔ]	/bɔl/	'ball'
[tɔy]	/tɔy/	'toys'
[ɟɛɲɛ]	/ɟɛɲɛ/ / /ɟaːy/	
[aaɓe] / [aaɓi]	/aaɓe/ / /aɓne-aɓ/	'refers to self'
[ka]	/kʰa/ / /khao/	'to eat'
[bai] / [bay]	/bay/	'bye-bye'
[tait]	/tait/	'tight.'
[ɓʰu]	/ɓhul/	'flowers'
[gi]	/gir/	'fall down'
[giya]	/gəya/	'gone'
[ɔ]	/ɔr/	'more'
[həma] / [ɵma-əma]	/həmma/	'Hamma-Hamma song'
[aana]	/aanahɛ/	'I want to come'

PRACHI'S VOCABULARY (BOTH COMPREHENSION AND PRODUCTION) AT THE AGE OF 15 MONTHS.

AS REPORTED BY HER MOTHER

1. [mama]	'maternal uncle'
2. [mɔmmi]	'mother'
3 [ɒaɒa]	'father'
4. [dada]	'grand father'
5. [dani]	'grand mother'
6. [nana]	'maternal grand father'
7. [nani]	'maternal grand mother'
8. [dedo]	'give'
9. [kao]	'cow'
10. [ʈuʈu]	'anything Broken'
11. [hɛ]	'what'
12. [bae]	'bye-bye'
13. [do do]	'give'
14. [la la la] [ɾu ɾu ɾu]	'Prachi produced these utterances when asked to sing'
15. [bibi]	'book'
16. [ahahaha] [aaaa], [aaae]	'Prachi produced these utterances when excited.'

PRACHI'S VOCABULARY (BOTH COMPREHENSION + PRODUCTION) AT THE AGE OF 18 MONTHS,

(AS REPORTED BY HER MOTHER)

1. [tɔy] 'toys'
2. [baba] 'baba'
3. [məmmi] 'mummy'
4. [ənku] 'ankur'
5. [nana] 'nana'
6. [nani] 'nani'
7. [cʰɔu]/ [nonu] 'sonu'
8. [ɪjə] 'caesar' (pet dog)
9. [dada] 'dada'
10. [dadi] 'dadi'
11. [bəa] 'bua' (aunti)
12. [bebi] 'baby'
13. [mani] 'pani' (water)
14. [ta-do] 'utar-do'
15. [baithe] 'baitho'
16. [ao] 'come'
17. [kao] 'cow'
18. [boba] 'bhõ bhõ' | dog bark.
19. [halo] 'kholo' | please open.
20. [kako] 'kato' | 'cut'
21. [hã-jɛ] 'hãji' | yes please
22. [antɪ] 'aunti'
23. [kʰana] 'anything served in a plate'.

24.	[dal]	'anything yellow in colour served in aflalē'
25.	[nɔ̃ĩ]	'no'
26.	[pɔtu]	'potty'
27.	[pɛnti]	'panty'
28.	[ice]	'niche' / 'down'
29.	[cɔo-cɔo]	'calo - calo' / lets go out.
30.	[hɔt]	'hot'
31.	[ninni]	'sleep' / I want to sleep.
32.	[nai-nai]	'bathing'
33.	[du-du]	'milk'
34.	[en]	'rain'
35.	[aha-aha]	'nice'
36.	[t̃a-t̃a]	'thundering sound'
37.	[bi-bi]	'book'
38.	[bɔch]	'finish'
39.	[ba']	'outdoors' / I want to go out
40.	[kĩc]	'keys'
41.	[hɔto]	'get away'
42.	[bɔn]	'close'
43.	[de-do]	'give'
44.	[jãt]	'jhat' (peek-a-boo)
45.	[tu-tu]	'broken'
46.	[aũa-a]	'round-round' (favourite play)
47.	[bo bo]	'dog'

The meanings of words as ~~un~~ reported are the observations of her mother.