

**The Linguistic Development of Children with Cerebral Palsy**

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## **ABSTRACT**

Children of CP (Cerebral Palsy) undergo reasonable delay in the acquisition of language along with some other acquisitions such as logical reasoning, motor ability, etc. The focus of this research paper is to observe the major linguistic developments in children suffering from CP plus to hypothesize whether they could be conditioned to learning language. 10 children have been observed at a school, *PRAYAS* Centre. Parents of two of those children and the principal of *PRAYAS* have been interviewed as well.

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# **CHAPTER 1**

## **INTRODCUTION**

### **1.0 Introduction**

Children with cerebral palsy (CP), a disease that a child acquires at the critical period of life i.e. 0.1-2 years of life, undergo reasonable delays in the acquisition of language along with some other delays such as, motor ability, logical reasoning etc. In acquiring a first language a child with CP, no wonder, therefore, behaves differently than that of a normal child, who would learn the first language at a greater speed and with ease. 10 children of varied age, 5-12, have been observed at a specialized school and their parents have been interviewed to find out the prominent linguistic elements in their linguistic repertoire. The prime aim of this paper is to find out the linguistic development, i.e. phonological, morphological, semantic, syntactic and cognitive, of those children. Also, to justify Lenneberg's (1964) Critical Period is of central interest; Lenneberg (1964) suggested that if no language is learned by the critical age, language acquisition becomes a hard nut to crack.

### **1.1 Problem Statement**

It has been observed that children suffering from CP undergo sever difficulties in communicating with others. Their speech is somewhat fragmented and impaired which makes it difficult for the adults to understand them. However, it is assumed that they do try to communicate with their surroundings even with the limited speech they possess. Therefore, the interest of this paper is to investigate the major developments in these children's speech and to what extent.

## **1.2 Purpose of the Study**

The purpose of this study is to examine the linguistic development of those children mentioned above. To be more precise, this paper is an attempt to exploring whether Children of CP have any language at all. In doing so, their phonological development along with their morphological development has been taken into account. Colletta, N. opines, “sometime between five years of age and puberty, the ease with which children learn language disappears and children exposed to a new language will have more difficulty learning it.” Therefore, whether these children could be conditioned to learning language is another interest of this paper.

## **1.3 Central Research Questions**

Answers to the following questions are sought throughout the research:

1. Do children of CP refer to any particular objects with the sounds they produce; or are they produced in playful babbling?
2. Have they been able to acquire any morphological development yet?
3. Can they be conditioned to learning language?

## **1.4 Significance of the Study**

The significance of the study is multifold. The results; if found positive; will help them communicate with others using their mother language to some extent. In addition, this, my maiden attempt, will inspire me help Maisha, my sister, who is also a case of CP acquire her mother language. Later on, whatever conclusions derived throughout the study can be tried to generalize to the other children showing identical symptoms.

## 1.5 Limitations

There are, indeed, some drawbacks of this study. The presence of certain ambiguities by default has made the task difficult since psycholinguistics itself is a very ambiguous area. Other limitations might include-

- The subjects' lack of responses might pose difficulties working on them.
- They tend to have little eye contact which is a bar to learning.
- My own inability, at times, to understand their response might become problematic in reaching a conclusion.

Moreover, since this is a case study and, since the behaviors of children with CP vary greatly from individual to individual, it is difficult to say whether the conclusions of this study can be generalized to the other children with CP.

## 1.6 Operational Definitions

1. **Cerebral Palsy:** Cerebral palsy (CP) is an umbrella term encompassing a group of non-progressive, non-contagious motor conditions that cause physical disability in human development, chiefly in the various areas of body movement.
2. **Critical Period:** In developmental psychology and developmental biology, a critical period is a phase in the life span during which an organism has heightened sensitivity to exogenous stimuli that are compulsory for the development of a particular skill. If the organism does not receive the appropriate stimulus during this "critical period", it may be

difficult, ultimately less successful, or even impossible, to develop some functions later in life.

3. **Classical Conditioning:** Classical conditioning (also Pavlovian conditioning or respondent conditioning) is a form of learning in which one stimulus, the conditioned stimulus or CS, comes to signal the occurrence of a second stimulus, the unconditioned stimulus or US. The US is usually a biologically significant stimulus such as food or pain that elicits a response from the start; this is called the unconditioned response or UR. The CS usually produces no particular response at first, but after conditioning it elicits the conditioned response or CR. Conditioning is usually done by pairing the two stimuli, as in Pavlov's classic experiments. Pavlov presented dogs with a ringing bell (CS) followed by food (US). The food (US) elicited salivation (UR), and after repeated bell-food pairings the bell also caused the dogs to salivate (CR).
4. **Operant Conditioning:** Operant conditioning (or instrumental conditioning) is a form of learning in which an individual's behavior is modified by its consequences; the behavior may change in form, frequency, or strength. Operant conditioning is a term that was coined by B.F Skinner in 1937. Operant conditioning is distinguished from classical conditioning (or respondent conditioning) in that operant conditioning deals with the modification of "voluntary behavior" or operant behavior. Operant behavior operates on the environment and is maintained by its consequences, while classical conditioning deals with the conditioning of

reflexive (reflex) behaviors which are elicited by antecedent conditions. Behaviors conditioned via a classical conditioning procedure are not maintained by consequences. Reinforcement and punishment, the core tools of operant conditioning, are either positive (delivered following a response), or negative (withdrawn following a response). This creates a total of four basic consequences, with the addition of a fifth procedure known as extinction (i.e. no change in consequences following a response).

## CHAPTER 2

### LITERATURE REVIEW

#### **2.0 Definition of Cerebral Palsy:**

Rosenbaum, Paneth, Leviton, Goldstein, and Bax (2007) concluded that Cerebral palsy (CP) is a well-recognized neuro-developmental condition beginning in early childhood and persisting through the lifespan. Mac Keith and Polani (1959) defined CP as “a persisting but not unchanging disorder of movement and posture, appearing in the early years of life and due to a non-progressive disorder of the brain, the result of interference during its development.” In 1964, Bax reported and annotated a definition of CP suggested by an international working group that has become a classic and is still used. It stated that CP is a disorder of movement and posture due to a defect or lesion of the immature brain. Additional comments were added by Bax: “for practical purposes it is usual to exclude from cerebral palsy those disorders of posture and movement which are (1) of short duration, (2) due to progressive disease, or (3) due solely to mental deficiency.” Rosenbaum et al. (2007) also added that the CP concept placed an exclusive focus on motor aspects, and also stressed the specific consequences of early as opposed to late-acquired brain damage. According to Dammann and Kuband (2004),

The etymology of the term ‘CP’ is much more straightforward than the current discussion about the concept CP would make one think. ‘Cerebral’ stands for ‘related to the cerebrum’, i.e., the larger one of the two brains we have. ‘Palsy’ is an abbreviation for ‘paralysis’, which in turn refers to impaired motor function.

Freud said that preterm birth predisposes to paraplegic forms of cerebral diplegia three times more than general rigidity.

## 2.1 Critical Period Hypothesis:

Eric Lenneberg (1964) stated that the crucial period of language acquisition ends at around the age of 12 years. He claimed that if no language is learned before, then it could never be learned in a normal and fully functional sense. Curtiss, Fromkin, Krashen, Rigler and Rigler (1974) stated:

Lenneberg suggests that language is an innately determined behavior dependent upon certain neurological events, but obviously also dependent upon some unspecified minimal exposure to language at a certain stage in the child's development. According to him, language acquisition is precluded when lateralization of cerebral function is complete, which he believes occurs about the time of puberty. Hence the critical period for language acquisition is presumed to be during some period prior to onset of puberty; subsequent to this time, primary language by 'mere exposure' is hypothesized to be impossible

On the other hand, Krashen & Harshman (in Curtiss et al., 1974) argue that the development of lateralization of language is complete well before puberty, and suggest that lateralization and language acquisition may go hand in hand. According to Eric Lenneberg (1969), the two hemispheres namely, left and right, are involved at this age and later on a specialization takes place which is “the characteristics of differentiation”, resulting in left-right polarization of functions. “There is evidence that children at this age are capable of developing language in the same natural way as do very young children” (Eric Lenneberg, 1969). In Lenneberg’s opinion (1969) Neurological material strongly suggests that something happens in the brain during the early teens that changes the propensity for language acquisition. It is not known if the factors are involved, but it is interesting that the critical period coincides with the time at which the human brain attains its final state of maturity in terms of structure, function and biochemistry. In explaining the importance of critical period in the acquisition of primary language, Eric Lenneberg (1969) referred to the developmental histories of retarded children. At the

same time, he cautioned about making generalizations about all retarded children, “because so much depends on the specific disease that causes the retardation”. However, generalization, in Lenneberg’s (1969) view, is somewhat possible in cases of such diseases in which the pathological conditions are stationary e.g. “microcephaly vera or monogolism”.

## **2.2 Classical Conditioning:**

Classical conditioning is a type of associative learning. Ivan Pavlov (1951) described the learning of conditioned behavior as being formed by pairing two stimuli to condition an animal into giving a certain response. Classical conditioning focuses on reflexive behavior or involuntary behavior. George Windholz and P. A. Lamal (1991) believe that a reflexive stimulus, such as salivation, is triggered when a neutral stimulus, such as the ringing of a bell, is paired with an effective stimulus, such as food. This previously neutral stimulus evoked a response that was similar to the one earlier triggered by the effective stimulus only. “The previously neutral stimulus was now the conditional stimulus evoking a conditional response - the conditional reflex. The innate relationship between an unconditional stimulus (e.g., food in the mouth) and an unconditional response (salivation) was the unconditional reflex,” (George Windholz and P. A. Lamal, 1991). To support Pavlov’s acquired conditional response George Windholz and P. A. Lamal (1991) says, “The basic, unconditional reflex - the phylogenetic reflex - was too restrictive to allow the organism's adaptation to an ever changing environment. The acquired, conditional reflex - an ontogenetic reflex - was flexible because it consisted of a temporary association between a stimulus and response that was relatively easy to

establish or to extinguish. The conditional reflex was based upon the unconditional reflex, which emerged from a prior conditional reflex during the evolutionary development of the higher organisms. In this way the phylogenetic reflex evolved out of the ontogenetic.” Ivan Pavlov (1951) earlier claimed the same saying “Precise evidence is not available because science did not as yet get that far. But it is to reason that during the long period of development; well established (acquired) reflexes may become inherited.” Pavlov (1951) further added that some of the newly acquired conditional responses later transform themselves into unconditional responses through inheritance.

### **2.3 Operant Conditioning:**

B. F. Skinner (1977) in explaining operant conditioning says, “By its very nature operant behavior encourages the invention of mental or cognitive processes said to initiate action. In a reflex, conditioned or unconditioned, there is conspicuous prior cause. Something triggers the response. But behavior that has been positively reinforced occurs upon occasions which, though predisposing, are never compelling.” To Skinner (1977), any behavior is spontaneously generated i.e. without being noticed and thus taking the shape of “such cognitive entities as intention, purpose, or will.” Reinforcement and reward are two vital components of Skinner’s (1977) operant conditioning which, according to him, is provided with from the environment. Being a stern believer of “behaviorism”, this is how Skinner (1977) defined behavior, “If anything is ‘stored’, it is behavior”. “Having moved the environment inside the head in the form of conscious experience and behavior in the form of intention, will, and choice, and having stored the effects of contingencies of reinforcement as knowledge and rules, cognitive psychologists

put them all together to compose an internal simulacrum of the organism, a kind of Doppelganger, not unlike the classical homunculus, whose behavior is the subject of what Piaget and others have called "subjective behaviorism." The mental apparatus studied by cognitive psychology is simply a rather crude version of contingencies of reinforcement and their effects" (Skinner, 1977).

#### **2.4 Innatism:**

The theory itself is a belief that language acquisition is a natural innate process and that every child is biologically conditioned to learning his/her mother tongue ignorant of the environment around. This view is to some extent supported by Hume, F. Bacon, and some other. However, N. Chomsky (1976) was the one to explain this theory and thus giving the name of Innatism. According to L. J. Cohen and R. B. Le Page (1981), "Chomsky speaks of this system as a biological endowment that makes it possible for a grammar of the required sort to develop, when appropriate experience is given." Chomsky (1976) believes that the human brain is equipped with the Universal Grammar; the syntax learning competence and this, in Chomsky's (1976) words, 'maps into experience'. Chomsky's model, however, has been widely criticized by such linguists as, R. Clark, A. Crutandant, B. F. Skinner and some more. F. C. C. Peng (1973), to criticize Chomsky, has said that while grammar, the knowledge of a language is innate, language percept is not which is also evident in Chomsky's own statement: "In case of language, the 'system of beliefs' would now be called generative grammar, the system of rules that specifies the sound-meaning correlation and generates the class of structural descriptions

(percepts) that constitutes the language in question. The generative grammar, then, represents the speaker-hearer's knowledge of his language [1968:83].

## **2.5 Behaviorism:**

Behaviorism is a sort of psychological theory that denies any inborn ability to acquiring a language vis-à-vis innatism. The proponents of behaviorism, such as B.F. Skinner and J.B. Watson, reject any invisible object as a stimulus to language acquisition in children. Rather, they strongly believe that there is a great deal of dependence on and feedback from the environment around the children in acquiring a language. B. F. Skinner (1977) says, "The variables of which human behavior is a function lie in the environment." According to D. I. Slobin (1979), behaviorism attributes little credit to the innate structure, highly depending on a 'built-in' capacity to establish associations between stimuli and responses based on homogeneity. To him, "structure exists in the outside world, and the individual comes to reflect that structure." Reinforcement is the key to behaviorism, allowing the child to construct a sort of generalization of a particular behavior to his future behavior, as Skinner (1977) says, "Behavior comes under the control of stimuli under certain contingencies of reinforcement." In connection to reinforcement, J. Foss and T. Hakes (1978) thinks that the reinforcement proposal suggests that language acquisition is process of strengthening and shaping particular behaviors, in this case utterances. An individual attaches physical labels to physical things and collects physical objects according to labels properties, thus most stimuli acquiring control because of their place in contingencies of reinforcement. Skinner (1977) repeatedly confirms that it is the environment that develops, not a mental or

cognitive possession. The theory postulates that if anyone or anything loses something, such as an individual loses his will power, it is simply the case that he stops acting like someone with strong will power. However, this theory is not beyond criticism as are the other theories. J. Foss and T. Hakes (1978) found that a child must first learn to produce utterances in order for its utterance to be strengthened or shaped through reinforcement. Hence, reinforcement cannot easily account for the initial occurrence of utterances. D. I. Slobin (1979) criticized reinforcement process showing how reinforcement may result in faulty or tentative learning of grammar if generalized. He says, “The notion of ‘reinforcement’ is not a very convincing candidate for the explanation of language development.”

## **2.6 Cognitivism:**

Dissatisfaction with behaviorism’s strict focus on observable behavior led psychologists such as Jean Piaget and William Perry to demand an approach to learning theory that paid more attention to “inside the learner’s head”, best described as cognitive approach. Cognitive psychologists emphasized the importance of meaning, knowing and understanding. According to them, learning is a meaningful process of “relating new events or items to already existing cognitive concepts” (Brown, H. D. 1987). Unlike behaviorists, cognitivists argue that knowledge is actively constructed. From Perry’s (1999) point of view, successful learning requires a major personal investment on the part of the learner because it involves significant restructuring of existing cognitive structures. Cognitive psychologists see second language acquisition on the other hand, as the “building up of knowledge system that can eventually be called automatically for

speaking and understanding” (Lightbown and Spada, 1993). Dickens, T. E. (2001) opined that the rejection of many developmental psychologists of a behaviorist theory of language acquisition has led to a modular and distinctly nativist psychology of language development i.e. cognitivism. To Dickins, T. E. (2001), cognitive architecture underpinning language is organized along modular lines. Being a deviation from Chomskyan nativism, cognitivism, much alike nativism, emphasizes the role of a language acquisition device though the location of LAD remains argumentative. Works of such evolutionary psychologists, such as Leda Cosmides and John Tooby, has repeatedly claimed that much of our complex psychological make-up is the product of natural selection (Barkow et al. 1992 and Cosmides, 1989). Cognitivism mainly supports the infants’ ability to fast mapping e.g. acquiring new names for new things. Dickins (2001) also thinks evolutionary psychology is strongly cognitive and so is language, being an evolutionary process. In language acquisition, cognitivism refers to the ability to the understanding of meaning by assimilation and accommodation is highly advocated unlike behaviorism that placed more focus on triggering the stimulus.

### **2.7 Zone of Proximal Development (ZPD):**

Vygotsky (1978) points out that cognitive development results from a dialectical process whereby a child learns either through problem-solving experiences shared with someone else, usually a parent or a teacher but sometimes a sibling or peer or through independent problem solving. Zone of Proximal development in Vygotsky’s words, “ the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving

under adult guidance, or in collaboration with more capable peers (Vygotsky, 1987). ZPD bridges the gap between what is known and what can be known. Problem solving skills can be placed into three categories:

1. Those performed independently by the learner
2. Those that cannot be performed even with help
3. Those that fall between the two extremes, the task that can be performed with help from others. This can be shown diagrammatically:

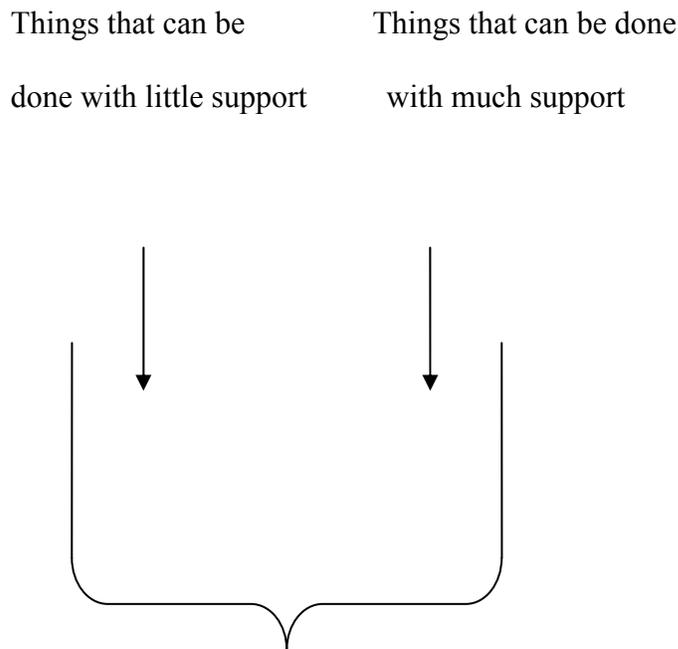


Figure 1: Zone of Proximal Development (ZPD)

## 2.8 Assimilation:

Foss, J. D. and David, T. H. (1978) thinks that children, in understanding the meaning of words, misunderstand more i.e. overgeneralize the meaning of one particular word to other objects that are contrastive. Clark (1970) proposed that children learn the

meaning of words one feature at a time. Thus, for example, while learning the meaning of tall, there is a point at which children know that “tall’s” meaning involves “bigness,” but they do not yet know that it is bigness in the vertical dimension that defines “tall” and distinguishes its meaning from that of “big”, “long”, “wide”, etc. This process of assimilation is the gateway to children’s learning the meaning of words. To Foss and David (1978), “Children do not acquire all the components of a word’s meaning at the same time.”

### **2.9 Accommodation:**

Howard Giles (1973) and his colleagues formed the accommodation theory in the 1960’s. Accommodation is the process of changing of cognitive structures in order to accept something from the environment. An individual adjusts or changes his understanding to incorporate aspects of an experience not currently represented in the cognitive structure. For example, a baby has to adapt its sucking movements if it to learn to drink out of a cup.

### **2.10 Piaget’s Learning Stages:**

Piaget (1920) describes himself as a genetic epistemologist who has a desire to specify the way in which children come to understand the working of physical world or logico-mathematical systems. Piaget’s discussion of organization is especially useful in helping to resolve the conflict between the two traditional views of the infant:

1. The view of the new born child as an amorphous lump waiting to be manipulated by his environment.

2. The view of him as a complex device carrying within himself a full blueprint for his future development.

Piaget (1920) concluded that the child passes through a series of stages, namely, sensorimotor, preoperational, concrete operational and formal operational. Each of these stages has a certain period of time.

The sensori-motor stage begins with the birth cry of the new born infant and last till about the 2<sup>nd</sup> year of life. This is when the infant begins to make use of imitation. Other noticeable developments at this stage are differentiating self from object, recognizing self as an agent of action, realizing object permanence.

The pre-operational stage starts at about the beginning of the 2<sup>nd</sup> year and continues to flourish till the 7<sup>th</sup> year. Learning to use language and to represent objects by images and words are the most striking features of this stage. At the end of the 7<sup>th</sup> year the pre-operational stage gradually gives way to the concrete operational stage when finally cognition starts taking its place in the child's brain. The child acquires conservation of number, mass, weight. Finally, logical thinking finds its place at the formal operational stage at the beginning of 11<sup>th</sup> year of life. The child then becomes able to hypothesize. Assimilation, accommodation, according to Piaget (1920), helps the transition from one stage to another.

### **2.11 Universal Grammar (UG):**

Chomsky's theory of language acquisition is based on the hypothesis that innate knowledge of the principles of Universal Grammar permits all children to acquire the language of their environment, during a critical period in their development. According to

Chomsky (1976), a child is genetically endowed with a system he refers to as Universal Grammar; a grammar which is unique to every language and which needs to be triggered with some linguistic data to be activated. To support his theory of UG, Chomsky (1976) claims that the everyday speech the child is encountered with is so impoverished and full of confusion that without the presence of a Universal Grammar/ LAD (Language Acquisition Device), it would be impossible for the child to learn his first language. Environment, to Chomsky (1976), functions as the source of data.

### **2.12 Babbling:**

The pre-linguistic sounds of the very early stages of child language acquisition are simply called ‘cooing’ and ‘babbling’. The period from about 3 months to 10 months is usually characterized by three stages of sound production in the infant’s developing repertoire. The development of sounds, both consonants and vowels, are noticed, however to a much reduced extent. Velar consonants such as /k/ and /g/ along with high vowels such as /i/ and /u/ announce the beginning of cooing. Later on, some fricatives and nasals also take place in the child’s repertoire. As the children grow up, the presence of intonation and stress in their sounds manifest emotion and emphasis. Some psychologists have suggested that this pre-language vocalization gives children some experience of the social role of speech because parents tend to react to the babbling.

### **2.13 The One-word Stage/ Holophrastic Stage:**

Nelson (1973) presented a model of the single-word that children produce-

Specific nominals : *daddy, mommy*

General nominals : *baby, cookie, hat, bottle, ball*

Action words : *up, sit, go*

Modifiers : *hot, allgone, more, here*

Personal-social words : *hi, bye, no, yes (yeah)*

It has been investigated that children's first words are similar all over the world; the words are phonetically like animal cries. From the perspective of adult grammar, the kinds of words that occur at this stage include simple nouns and verbs; there are as yet very few so-called function words (prepositions, articles, auxiliary verbs, interrogative words). At this stage children can specify objects as movers, movables, places, recipients and instruments. However, child's notion of mover is not yet the exact equivalent of the adult's agentive case: mover applies to a smaller group than the agentive and at the same time may include things like cars or trains that are not agentive (Schlesinger 1974; Bowerman 1974; Braine 1976). De Laguna argues that it is important not just to consider the word child expresses but also the gestures with which it accompanies the utterance and other aspects of the context of utterance. Ingram (1972) and Antnucci (1975) and Parisi (1975) make explicit claim that the child expresses only part of the sentence in its utterance. For example:

Recurrence : *more* (pointing to meat)

Negation : *no* (struggling to escape being held)

Possession : *John* (pointing to John's hat)

Action : *eat* (wanting to eat some berries) [Greenfield and Smith 1976]

Towards the end of the first year children may be using a characteristic pitch pattern with each of his early words and expressions. During the one-word stage they may begin to use the difference between a falling and rising pitch pattern systematically.

#### **2.14 The Two-word Stage/ the Telegraphic Speech:**

By the time the child is 2 years old, a variety of combinations *baby chair, mommy eat, cat bad* will be appearing. The adult interpretation of such combinations is, of course, very much tied to the context of their utterance. Between 2 and 3 years old the child will begin producing a large number of utterances which could be classified as multiple-word utterances. The salient feature of these utterances ceases to be the number of words, but the variation in word-forms which begins to appear. Of particular interest is the sequence of inflectional morphemes which occurs. Before we consider this development, however, we should note that there is a stage which is described as telegraphic speech. This characterized by strings of lexical morphemes in phrases such as *Andrew want ball, cat drink milk and his shoe all wet*. The child has clearly developed some sentence-building capacity by this stage and can order the forms correctly. According to Clark (1993) and Pinker (1994), around 18 months, language changes in two ways. Vocabulary growth increases; the child begins to learn words at a rate of one every two waking hours, and will keep learning at that rate or faster through adolescence. Children's two-word combinations are very similar across cultures. Everywhere, children announce when objects appear, disappear, and move about, point out their properties and owners, comment on people doing things and seeing things, reject and request objects and activities, and ask about who, what, and where. These sequences already reflect the

language being acquired: in 95% of them, the words are properly ordered (Braine 1976; Brown 1973; Pinker 1984; Ingram 1989).

During this stage children begin to express certain relations. They use word order to indicate certain semantic relations. Bowerman (1973) indentified eight relations which occurred frequently in the two-word utterances. The experiment was on two-year old girl called Kendall. These were:

Verb and Agentive	: <i>kendall swim</i>
Verb and Experiencer	: <i>see kendall</i>
Verb and Goal	: <i>writing book</i>
Verb and Locative	: <i>play bed</i>
Verb and Objective	: <i>shoe off</i>
Agentive and Objective	: <i>kendall book</i>
Experiencer and Objective	: <i>kimmy bike</i>
Locative and Objective	: <i>pillow here</i>

The main constituents of sentences are all present during the first year of syntax: verb phrases, noun phrases and adverbial phrases. The structural types are subject + intransitive verb (*Teddy sleep, Jenny crying*); subject + be (adjective), the copula being omitted at first (e.g. Mummy busy, Daddy tired). These early types of child utterances have been called telegraphic (Brown and Bellugi 1964).

The short sentences of children seem to consist of two parts of speech joined together by some simple rule. This apparent fact was first discovered by Buaine (1963) and he named the two classes- pivot and open. Pivot words are very small class compared to open words, and their number grows very slowly. And pivot words unlike open words,

are rarely used on their own as single-word utterances. The majority of early two-word utterances seemed to have the following structure:

Pivot + Open (*see boy, allgone shoe*) or

Open + Pivot (*do it, close it*).

### **2.15 The Advanced Stage:**

Between the late two's and mid-three's, children's language grows into fluent grammatical conversation so rapidly that it overwhelms the researchers who study it, and no one has worked out the exact sequence. Sentence length increases steadily, and because grammar is a combinatorial system, the number of syntactic types increases exponentially, doubling every month, reaching the thousands before the third birthday (Ingram 1989; Brown 1973; Limber 1973; Pinker 1984).

Over this period Brown (1973) traced the development of fourteen grammatical morphemes in the speech of the three children he was studying. These were: present progressive (*I walking, I playing*), prepositions (*in and on*), plural inflections (*-s, -es*), past inflections on irregular verbs, possessive inflections, uncontractible copula (*e.g. in, am, are*), articles, past inflections on regular verbs, regular third person forms (*e.g. does, has*), uncontractible auxiliary forms, contractible copula and contractible auxiliary.

During the grammar explosion, children's sentences are getting not only longer but more complex, because the children can embed one constituent inside another. Whereas before they might have said *Give doggie paper* (a three-branch verb phrase) and *Big doggie* (a two-branch noun phrase), they now say *Give big doggie paper*, with the two-branch NP embedded inside the three-branch VP. They can now use imperative,

exclamatory and optative sentences. It is safe to say that except for constructions that are rare or predominantly used in written language, or mentally taxing even to an adult (like The horse that the elephant tickled kissed the pig), all parts of all languages are acquired before the child turns four (Slobin, 1985/1992).

### **2.16 Semantic Development or Acquisition of Meaning:**

Children do not hear sentences in isolation, but in a context. No child has learned language from the radio. Ervin-Tripp (1973) studied hearing children of deaf parents whose only access to English was from radio or television broadcasts. The children did not learn any speech from that input. One reason is that without already knowing the language, it would be difficult for a child to figure out what the characters in the unresponsive televised worlds are talking about. In interacting with live human speakers, who tend to talk about the here and now in the presence of children, the child can be more of a mind-reader, guessing what the speaker might have meant (Macnamara, 1972, 1982; Schlesinger, 1971).

It is believed that before the child has learned any syntax, he knows the meaning of many words, and he might be able to make good guesses. In fact, parental speech to young children is so redundant with its context that a person with no knowledge of the order in which parents' words are spoken, only the words themselves, can infer from transcripts, with high accuracy, what was being said (Slobin, 1977). Many models of language acquisition assume that the input to the child consists of a sentence and a representation of the meaning of that sentence, inferred from context and from the child's knowledge of the meanings of the words (e.g. Anderson, 1977; Berwick, 1986; Pinker,

1982, 1984; Wexler & Gleitman, 1985). Children do not hear every word of every sentence, but perceive the entire meaning of a sentence from context. Blind children, whose access to the nonlinguistic world is obviously severely limited, learn language without many problems (Landau & Gleitman, 1985). And when children do succeed in guessing a parents meaning, it cannot be by simple temporal contiguity. For example, Gleitman (1990) points out that when a mother arriving home from work opens the door, she is likely to say “Eat your peas” when her child is, perhaps, looking at the dog, and certainly not when the child is already eating peas. It is suggested that children learn by making semantic errors, taxonomic categorization bias, mutual exclusivity, shape bias and substance bias, syntactic bootstrapping and caregiver’s speech.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.0 Introduction:**

Children with cerebral palsy (CP), a disease that a child acquires at the critical period of life i.e. 0.1-2 years, undergo reasonable delays in the acquisition of language along with some other delays such as, motor ability, logical reasoning etc. In acquiring a first language a child with CP, no wonder, therefore, behaves differently than that of a normal child, who would learn the first language at a greater speed and with ease. The prime aim of this research is to find out the linguistic development, i.e. phonological, morphological, semantic, syntactic and cognitive, of the children suffering from CP, which they acquire at the Critical Period. Another central interest of this research paper is to justify Lenneberg's (1964) Critical Period; Lenneberg (1964) suggested that if no language is learned by the critical age, language acquisition becomes a hard nut to crack.

#### **3.1 Research Design:**

To proceed with the research, 10 children of varied age, 5-10, have been observed over a period of 7 days at a school specialized in educating and socializing those children. Observations were centered around but not limited to finding out the linguistic elements that these children use to communicate with others. To add strong feedback with the findings, parents of two of those children have been interviewed as well. Parents' interviews mainly focused on finding whatever was not possible to find out while observing them at school. Frequent visits have also been made to another child, newly declared a case of CP, to find out the initial symptoms that they tend to show. Instructors

at the school have been instrumental to help conduct the research as it has been found that they try to make these children imitate whatever they speak or act out. The instructors were asked to focus the especially on working on their speech during the period of observation. Later on, the instructors have been interviewed as well. The researcher was himself present in the process and silently observing the class as it went.

Interviewing the parents of those children has been a major help to this thesis paper as according to Parke (1978), cognitive capacities of the infant and parent could functionally be treated as similar. Parents were asked about the linguistic and cognitive development of those children. A set of questionnaire was prepared which can be found in appendix. As the content of this paper is case sensitive, the researcher had to be careful about not asking any questions such as genetic factors, etc. that could hurt the parents' feelings.

To prove the effectiveness of Critical Period hypothesis (Lenneberg, 1964), the other developments along with linguistic development of those children has also been considered. The availability of different age group has been a great help to this process. Observations were focused on how many children, if any, have been able to come back to normal life after acquiring Cerebral Palsy at Critical Period and how successful they have been in the development of motor, functional and linguistic developments.

Throughout the research, answers to the following questions have been sought:

1. Do children of CP refer to any particular objects with the sounds they produce; or are they produced in playful babbling?
2. Have they been able to acquire any morphological development yet?

### 3. Can they be conditioned to learning language?

#### **3.2 Sampling:**

10 children of varied age, 5-10, over a period of 7 days at a school specialized in educating and socializing those children. Also, frequent home visits has also been attempted to see the difference of those children's behavior in two different situations i.e. formal and homely. Additionally, the parents of two of those children plus one of their teachers have also been interviewed.

#### **3.3 Theoretical Framework:**

On theoretical ground, this research paper is designed around the theories of first language acquisition i.e. how a child learns a first language. The teachers were instructed to use classical conditioning (Pavlov, 1951) and operant conditioning (Skinner, 1977) while teaching the class a certain lesson. For example, while teaching the subjects how to say *assala mu aleikumm*, a traditional form of greeting, the teacher repeatedly said *assala mu aleikum* with his right hand touching the right part of his forehead. The subjects then, after a few repetitions, tried themselves to do it. Successful attempts by the subjects were applauded by the teacher.

The observer has also been in search of any child who, after the attack of CP, during the Critical Period, has been able to come back to normal life, and become successful in acquiring a language to try out the critical period hypotheses.

A through observation of the speech of the subjects is also done and listed to find out the major linguistic elements in their linguistic repertoire. For this, different

phonological, morphological, semantic and syntactic theories have been taken into account.

### **3.4 Nature of Research:**

Since the field of this research is such that the subjects' responses are limited and as it is an area of research where quantitative research comes to little use, a qualitative approach to research is adopted. Moreover, this research is more of new discoveries than of a hypothesis testing which is why a quantitative research might not provide with adequate data that are required.

### **3.5 Setting:**

The research largely took place in a special school, *PRAYSH*, located in Rajshahi. Additionally, frequent home visits have also been made to interview the parents of the subjects. The two different types of setting helped the thesis in a way that the researcher could find the difference of behavior and response of the subjects at school and at home. The participants of this study were all aged between 5-10, all patients of cerebral palsy. Three of the participants were female and 7 of them were male. Three teachers including the founder of *PRAYSH* have also been instrumental in conducting the research.

### **3.6 Instrumentation:**

Observing the subjects and noting down and analyzing their response have been a major instrument for this research. Also, two different sets questionnaires have been prepared for parents and teachers. Questionnaire designed for parents focused on the subjects' verbal and para-linguistic features plus their cognitive capacity. Questionnaire

designed for teachers focused on the same aspects, from a more linguistic point of view though.

### **3.7 Data Collection Procedure:**

The data, required for this paper, have been collected using a two-fold methodology; classroom activities observation and interview of the parents of the subjects as well as their teachers at school using a uniform questionnaire.

### **3.8 Data Analysis Procedure:**

A qualitative approach to data analysis was deemed to be fitting the purpose of this paper since the author's focus was to invent the linguistic and para-linguistic items in the subjects' repertoire. The linguistic items found throughout observation and parents'/teachers' interviews have been analyzed through the standard of linguistic theories. However, a qualitative approach is also used in testing the hypothesis that children attacked by cerebral palsy during the critical period can hardly acquire language afterwards.

### **3.9 Obstacles Encountered:**

The list of challenges is quite a few that has come across during the thesis conduction. Firstly, the context of Bangladesh is not a very welcoming one to allow an individual to conduct a thesis on such an area. There is also the inertia of parents to expose their children's problems freely. Acquiring permission from the authority to survey the school was another difficult task as they hardly welcome any one without legal papers inside the school premise. Finally, the author's own limitation to understand the

subjects and scrutinizing several cognitive other than linguistic, which by turn is a psychological deviation, made this paper a real challenge. Constrain of time to meet the deadline was an additional obstacle too.

## CHAPTER 4

### FINDINGS AND DISCUSSION

#### **4.0 Acquisition of Phonology:**

Since speech is an ‘overlaid function’ (Sapir), we learn very early in life the use of the respiratory mechanism simultaneously for speech as well as breathing (Curtis. et al, 1974). The major phonological developments in the subjects are analyzed from the first hand class observation. It is found that they tend to produce several unrecognized sounds, some of them in a rhythmic pitch pattern. This chapter presents the sounds that these children produce and attribute them their proper phonological name.

#### **4.0.1 The Development of vowels and Consonants:**

Among the 10 children studied, 4 of them are found to be verbally very active and producing as many sounds as they can. Of the remaining 6 children, 2 were speechless (as per their parents and teachers), and the remaining 4 were more of passive users of speech; they prefer more to follow commands.

It is found that the 8 children with speech still produce single syllabic sounds with open vowels such as, /বাবা/, /টাটা/, /দাদা/. One of the subjects is found to produce sounds using the same vowel, for example, /a/ at the beginning and different consonants, bilabial and labio-dental, at the end such as, /আবা/, /আতা/, /আদা/, etc.

However, it cannot be said surely whether these children recognize the objects they refer to as in several attempts they failed to point the objects by their names when presented before them. In addition, they tend to over-generalize the same sounds to refer

to different objects. For example, one female child uses the same sound /আপা/ to refer to her brother, mother, and sometimes everyone else. Another male child is found to use the same question, “ভাল আছেন?” (How are you?), even when someone is supposed to say him goodbye.

One noticeable thing about them was delayed production of the vowels /□/ and /□/. They show efficiency in producing the front vowels like /□/, /e/ and /□ /.

Again the female child mentioned earlier, is found to use the same vowel / □ /, using different tongue positions. It seems that she uses them to refer to different objects. In producing / □ /, she, in some occasions, lets her tongue flat and downwards as it is normally produced, and in some other occasions, she rolls her tongue tip, raising it towards the back, trying to touch the hard palate. Seemingly, she tries to produce the sound /r/.

Common to first language acquisition in normal children, these children are also found to learn the consonant sounds by contrast. One of the children were found to produce sounds that are dominantly nasal versus apical such as, /মামা/, /বাবা/, /নানা/ and /পাপা/. The major consonant sounds that these children tend to use are fricative, /ফু/; as in making a cup of tea cold or referring to a flower; the velar, /কা/; to ask someone to eat or pointing to a crow; and /গা/; while trying to sing.

However, it is interesting to observe that two of those children keeps repeating the same sound again and again, for example /কাকা...../. It cannot be said exactly what message they want to convey. But, it can be felt that they must be very excited as they repeat a sound.

#### **4.0.2 Use of Intonations:**

It is also worth a mention about the use of intonation that these children use which is the most striking characteristics of their linguistic repertoire. It is believed that children effectively master the intonation pattern of their language before they have learnt any language at all (Bever, Fodor and Weksel, 1965). Similarly, these children use certain intonation to make their sounds intelligible to others despite the limited linguistic repertoire.

It has been observed that among the 10 children, three of the four with language to some extent use the same sounds with different pitch pattern and intonation which is indicative of conveying different message. For example, the female child, who over-generalizes /আপা/, does it differently with different pitch and intonation. When she calls her mother her pitch is soft and full of affection. On the contrary, her tone is rather a scared one when she calls her brother as he always forces her to do physical exercise.

#### **4.1 Acquisition of Morphology:**

No satisfactory morphological development is noticed in the subjects throughout the study. However, one male child, comparatively older than the others, does show some morphological element present in his linguistic repertoire. He has a variety of words and can refer to the proper objects by their names.

It has been found that all the other subjects, except the one mentioned above, predominantly use nouns such as /aam/, /kaak/, /paani/, etc. Verbs, modifiers and determiners are not found in their speech. However, the male child can use verbs, adjectives, modifiers and determiners to a limited extent though. For example, he struggles to indicate objects by their numbers i.e. if a single pencil is presented before

him he knows it is pencil. However, he cannot say how many pencils if a bundle of pencil are presented. The phrase he uses to describe them is “*Onek Pencil*”. He can also say if he feels bad or good about anything to which the others have no answer.

At this point it is also worth a mention that any normal child of this age as the children studied, are in between the pre-operational and concrete-operational period (Piaget,). Unfortunately, these children are lagging way behind and can be described as fumbling in the sensory motor stage.

#### **4.2 Syntactic Development:**

This paper is a failure in finding out any syntactic development in those children. All the children except the older male child cannot get their message across in a single sentence.

Even the male child has restricted access to the wide arena of syntax. If his syntax is analyzed, the major elements that can be found are:

Agent+Action; *Ami pori.*

Agent+ (copula) +modifier; *Ammu Lokkhi.*

Object+Action; *Gaan Kori.*

Modifier+object; *Kalo Uncle*

Apart from these handful syntax structure, there are hardly anything satisfactory found throughout the study.

#### **4.3 Cognitive Development:**

To have a bird's eye view of these children's cognitive development, a seven day observation is attempted. As well, their parents and teachers are interviewed.

Throughout the observation it has been found that 3 of the 10 children respond to their names by raising their hands as they are called by name by the teacher. The others remained ignorant to the teacher's call. However, 2 of the remaining 7 could show some sign that they understood that they were being called as they smiled whenever their names were called by the teacher in rhyme.

In a song "Twinkle Twinkle" by the teacher, all the students participated spontaneously as they could. The ones with some or little speech sang it with the teacher and the ones without any speech acted it out by their facial and body expressions which is a sign that these children do understand some if not much of the adult language.

It has also been found that the parents as well as teachers of these children believe that their children do understand some of the adult language as evident from their interview (Appendix 1 & 2). However, this is the situation when they use a different type of communication system associated with the language used. Also, years long intimacy with those children plays a vital role here.

Additionally, a child, newly acquired CP, has been visited by the observer and found that he is, even though suffering from CP, quite capable of understanding and responding to what he is asked to do. For example, he responded to his mother and gestured *ta ta* to the observer. He also attempted to kiss his mother when requested by her.

#### **4.4 Can they be conditioned to learning language?**

Since the subjects studied share heterogeneous learning and responding capabilities, it is difficult to reach a firm conclusion that they can be conditioned to learning language. 2 of them have not developed any recognizable sounds yet. It cannot be said that they could be taught language.

Of the remaining 8, 4 children were verbally active and it has been found, after interviewing the teachers, that they are learning language at school and showing progress gradually. It has been observed that they respond to their teachers and parents which is a sign that they understand language. They also reply in turn to whatever is asked which manifests that they are learning language. For example, one child called Fardeen can recognize colors such as white, red, yellow when asked by the teacher to do so. Another, child named Abid can count numbers up to 100. They are also capable of learning new items. For example, a new rhyme “humpty dumpty” was introduced by the teacher and they could easily capture that ahead of the others.

However, there are also other 4 children with little or limited speech who still struggle to learn. Maisha, a 5 year old girl, could easily respond to the teacher when asked to sing the national anthem “amar shonar bangla” though her speech was not intelligible. But, she could at least respond to the request. However, there are other situations, for example her mother asks her to say “amar naam Maisha” (My name is Maisha), she could not respond rather keeps staring at her mother. It is difficult to say whether they can be taught language. And, if yes, how much can they be taught? More expertise and in-depth study is required to determine that.

#### **4.5 Results of Parents’ and Teachers’ Interviews:**

It has been observed that all the children have acquired cerebral palsy during the critical period of life which advocates the effectiveness of Lenneberg's Critical Period Hypothesis.

However, the fact that they do try to communicate with others cannot be denied as their parents and teachers pointed situations where they try to communicate using meta-linguistic cues such as, pointing hands to an unknown destination (appendix 2, interview 1), smiling (appendix 2, interview 1), etc.

These children, according to their parents and teachers, not only speaks chunks of language but also they understands adult speech e.g. instruction, command, request, etc. Unfortunately, not all of them can respond to questions. However, there are exceptions like Abid (appendix 2, interview 2), who can speak the first language well ahead his other classmates at school. Surprisingly, he was born with the same language deficit and eventually developed his speech which indicates to the point that these children are subject to overcome language deficit. The teacher (appendix 3) also mentioned about a boy, Shimul, who has been able to come back to normal life and now attends regular school. However, it has to be remembered that the extent of brain damage plays a vital role in relation to whether they can overcome language deficit (appendix 3).

#### **4.6 Answers to the Central Research Questions:**

In answer to the first research question "Do the children with CP refer to any particular object with the sounds they produce?" it has been found that 6 of the 10 children studied do refer to the objects they desire with their sounds. And, Abid is successful in referring to almost all the objects he is asked and his language is richer than

the others. Maisha can point to tea, crow, TV, her father and mother with their names. Fardeen can refer to colors if he is asked to point. Abid can count numbers and can differentiate between singulars and plurals occasionally.

Any morphological development which would answer; “Have they been able to acquire any morphological development yet?” has been disappointing. Except for Abid, none of the children could show any lexical development let alone the inflations, singular/plural, etc.

In finding out if these children can be conditioned to learning a language, it has been observed that the subjects studied share heterogeneous learning and responding capabilities, and it is difficult to reach a firm conclusion that they can be conditioned to learning language. 2 of them have not developed any recognizable sounds yet. It cannot be said that they could be taught language. However, more studies could be attempted trying out a solution.

## **CHAPTER 5**

## CONCLUSION

As mentioned above this research is a maiden attempt to study the linguistic development of the children acquired Cerebral Palsy very early in childhood. Throughout the research the prominent linguistic elements in those children are sought which ultimately led to another investigation whether these children could be conditioned to learning which in turn can be a topic for further thesis paper.

As a whole it can be said that the primary means of communication i.e. language is somewhat invisible and dormant in these children except a few. 8 of the 10 subjects that are studied lack a primary language as means of communication. Even the 2 children with language has impaired and faulty construction of syntax. It is difficult to conclude how much they can improve as they grow up as 1 subject is found to have forgotten many of the sounds and words that she learned earlier.

However, it is hypothesized that with the help of modern technology and logistics such as audio-visual aid, speech therapy, etc. their language acquisition can be stimulated. The teachers at the school have been found trying the same. Surprisingly, it has been found that parents of these children communicate with them as they would do with a normal child. Therefore, to investigate and find out any special means of communication can be another topic of further study.

This research paper helps the other investigators, interested in studying children with similar disabilities, in a way that they get to have a bird's eye view of the linguistic development of these children. However, it has to be remembered that such children,

much alike any normal children, differ from one another and so do their development. So, a generalization of the findings can lead to erroneous findings.

While working on this paper some other research topics on the same area such as cognition test, logical reasoning test and language acquisition extent test have been thought which can be attempted in future.

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## **APPENDIX 1**

### **A Brief of Maisha's Profile**

Maisha is the third child of her parents, born relatively late than her other siblings. Whether any genetic factors contributed to Maisha's disability is not known. However, she was reported to have delayed birth cry and frequent convulsion followed by regular fever at the age of 1;5. It has been assumed that her frequent convulsion contributed to her disabilities. Before the attack, she did show some phonological developments at her cooing and babbling. Unfortunately, though, ever since she has been declared as a case of CP, her linguistic developments, not to mention other motor developments, standstill, and she has become an eye catchy subject at the roads; every passer-by, at the sight of her, stops by and asks her parents, "Is she sick?" However, the social structure nowadays is getting changed and welcoming such disable children with a more positive and broadened outlook. Maisha is now admitted to a school, specialized in socializing children with disabilities. Admitting that these children can hardly come back to the normal social life, the school tries to help such children learn at least some aspect of the normal social life. Maisha's admission into the school seemed to have opened a new window for her. She is successfully learning the social aspects, taught at the school. But, she only responds to them when she feels like doing it. To put it in another way, she always tries to respond but succeeds occasionally. Notwithstanding all the difficulties, her family is trying to adapt to the ridicule of fate and the hostile air of the society, and thus trying to socialize the child.

## APPENDIX 2 Parents' Interview

### Interview 1

- Since when has your child acquired CP?

Answer: According to the doctors, she had delayed birth cry which eventually resulted in CP.

- Does she speak a little?

Answer: You won't believe, she says so many things but if only someone could understand her!

- What are the words that she utters?

Answer: She loves to call her "baba" (father) all the time even when he is not around. She also likes to see the "ka" (crow) from the window side. She likes to drink "ta" (tea). And, she; whenever sees her father or brothers go outside being well-clad; says "baaiie" (outside) pointing her finger to an unknown distance.

- Does she utter any sentence?

Answer: Unfortunately, she is 5 years old and doesn't speak any sentence whereas children of her age say all the sentences in the world.

- How does she communicate then?

Answer: I know it's difficult for her to communicate. But my child is a brave one. She cries loudly saying "ma" whenever she feels the need of toilet. You won't believe but I can feel that she is upset with someone as she constantly keeps shaking her head in presence of that person. When she feels affectionate to someone she grabs his/her, for example brothers, face, taking it closer to her, and kisses his/her cheeks repeatedly.

- Does she understand if you tell her something?

Answer: Not everything. You can't expect these children to understand everything you say. But, if I tell her not to do anything, she listens to it. For example, I am busy working in the kitchen and she comes in the kitchen trying to play with the remains of any vegetable. She would stop doing it if I say "Na, mona, eta bhalo na" (No, dear, this is not good). She would look at my face for a while and a soft smile which indicates that she got the point.

- Has she really progressed over the years?

Answer: Well, that's the most difficult part. I can't say she has. But, if I say she hasn't that will be unfair. Because, her eye contact has been improved immensely. She now looks towards the person who speaks to her. She can hold a pencil now and try to draw. Can you believe that if you give her a book or a paper, she pretends to read it busily?

But, I think she herself is not sure what she is doing. In several occasions you will see that she does the same thing to many other different things. Say, she calls you

“dada” (brother) and, then, she uses the same address to her father, mother, and everyone else.

- Is she taking speech therapy?

Answer: The teachers at school are giving her speech exercises like, songs, rhymes, etc. every day.

- How would you define your child’s learning capacity?

Answer: You can’t really expect these children to learn as normal children do, can you? But, in her case, she seems to be way behind from her peers. As I have mentioned earlier, she learns things if she is taught, but she forgets it so quickly. (Translated version)

## **Interview 2**

- When did you first notice that Abid (the name of the child) is different?

Answer: Abid was born with defective arms and legs. But, as soon as he was 1 year old we realized that he also was intellectually weak.

- Can he speak a little?

Answer: I would rather say he speaks fairly well ahead of many other children same as he.

Then she asks Abid, “Abid, abbu, tomar prio rong ki boloto?” (Dear Abid, can you tell uncle your favorite color?). Abid sitting next to his mother looking at a distance beyond the window says, “amar, amar, hmmm, pio(priyo) long (rong) holo, seta sada.” (Hmm, my favorite color is white).

- What else does he say?

Answer: A lot of things but you have to be that expert to understand what he says. He can’t express his anger. Instead, he says, “Amar mon ta kharap” (I am very upset). When he says, “Ami aar basai thakbo na” (I won’t continue in this house anymore), you must know that he wants to go out for sightseeing.

- What are the sentences that he says? (N/A)

- How does he communicate then? (N/A)

- Does he understand if you tell him anything?

Answer: That I cannot say because there are moments when I find him very much understanding my instructions. However, if I ask him to ask someone something for example, “Abid uncle ke proshno koro je ‘uncle tumi kemon acho?’” he won’t.

- How would you define Abid’s progress in terms of linguistic development?

Answer: I am very much satisfied with Abid's speech. He is much better than the other children. But, he was not the same some three years ago. We tried hard and persistently to help him speak. And, finally he can now at least speak.

- How did you work on his speech development?

Answer: Oh, that's a long story. I used to take him to the speech therapist once a week. Besides, his father and I persistently showed him objects by repeating their names. Finally, when he used to imitate, we felt happy. One thing very good about Abid is that he tries to imitate, late though, if he is taught anything. (Translated version)

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### **APPENDIX 3**

#### **Teacher's Interview**

(The teacher is also the founder of the school)

- How long have you been running the school?

Teacher: It's been 10 years. I have started this mission since my twin children were 3 years old. Now they are 13.

- Where has this inspiration come?

Teacher: You know my children are patients of CP too. I found them very helpless and they need someone to take care of them. But I can't always be around if I am involved somewhere else. So, I decided to open this school.

- Have you ever seen any child of CP to cure?

Teacher: Yes, I know about one. A boy called Shimul. He came to this school when he was 4 years. His speech was the only problem. He was fine otherwise. After three years, he left the school and got admitted into a regular school.

- Do you think these children could really be taught language?

Teacher: I would say it depends. Not every child has the same learning capacity. Also, the extent of brain damage plays a vital role here. The less the brain damage, the better the chance of learning there is. In my case, both my children have severe brain damage. The doctors say that more than one third of the left side of their brain is damaged. I have been trying to teach them language for years. I spent years finding solutions. But, little have I achieved so far. However, they now understand what I say.

- Theoretically, what are the methods that you follow at school to teach them language?

Teacher: At the school, our main goal is to help them at least learn the least needed communications. For example, to express the need to go to toilet, to express hunger, to express pain (physical/mental), to express feelings, etc.

We use different techniques on different occasions such as, songs, rhymes, loud voice with a lot of drama, etc. We also use visual effect associated with speech in such situations as teaching them colors, shapes, forms, etc.

- So, can we say that you emphasize reinforcement and reward in teaching language?

Teacher: Yes, you can say that.

- Have ever tried to elicit a certain behavior/speech of any child and condition him to learn it?

Teacher: hmmm, it is difficult to do here because I have limited source here. The teachers have not yet been trained properly. They need more training. Moreover, you hardly find any child with inventory capacity.

- If I ask you to draw a conclusion about my thesis what would it be?

Teacher: I would say I like what you are doing. But, you need to stay with it. We need more people working for this purpose. You and I feel this because we have family members each in our home suffering from this curse. But, the society overall should come forward also to help us help these children. I wish you all the best in your attempt.

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