CHAPTER I

INTRODUCTION

I.1 Background of the Study

The brain is the control center of the body. When something goes wrong with the brain, something happens to the physical, emotional, or mental functions of the organism. The number of things that can happen to the organism are probably as numerous as the nerves and cells of the brain.

An injury to the brain, or lack of development of the brain, is likely to result in disabilities of various kinds. Cerebral palsy refers to "palsy" or motor disability resulting from a deficiency in the cerebrum (brain). The United Cerebral Palsy Association formulated the definition of cerebral palsy as follows:

> Cerebral palsy embraces the clinical picture created by injury to the brain, in which one of the components is motor disturbance. Thus, cerebral palsy may be described as a group of conditions, usually originating in childhood, characterized by paralysis, weakness, incoordination or any other aberration of motor function caused by pathology of the motor control center of the brain. In addition to such motor dysfunction, cerebral palsy may include learning difficulties, psychological problems, sensory defects, convulsive, and behavioral disorders of organic origin (Kirk, 1962:245).

More specifically, lesions of the central nervous system which cause cerebral palsy are also lesions which may directly or indirectly affect central neural mechanism supporting the central speech system (e.g., areas including the midbrain, basal nuclei, thalamus, and speech cortex). Such lesions may also have direct or indirect repercussions on the peripheral neural mechanism (i.e., cranial,

cervical, and thoracic nerves) serving the interrelated and the interdependent peripheral speech subsystem of respiration, phonation, and articulation. In addition there may also be lesions in the peripheral auditory system and secondary malocclusion due to irregular oroneuromaturation. Further there may be adverse environmental reaction to the organism and its involve speech system (Mysak, 1968:674).

In the baby with cerebral palsy, the voluntary vocalization that begins at 6 weeks may not occur, voice production being affected by poor head control and posture. Vocalization may be involuntary and associated with extensor thrusting. Conversely, attempts at vocalization may cause tonal reactions and target sounds cannot be achieved. Babies with poor control over their voluntary movement or hypotonia will have difficulty in approximating the articulators and will lack experience in producing sounds. This has implications for praxis and also for the acquisition of a phonological system (Cogher, Savage, and Smith, 1992:28).

Cerebral palsied children must, at least, be given a fair chance to overcome their handicaps and to live as normal life as possible. They need our treatment; those are physical therapy, occupational therapy, and speech therapy. The basis of child's disability seem that he could not move his body in a normal way, and the physical therapist was the obvious person to deal with such a condition. The occupational therapist teachs the child the basic skills of feeding, dressing and looking after himself as far as he is physically able. The speech therapist helps him to speak. In few of fundamental urge of human beings to communicate to each other, the work of speech therapist inevitably assumes considerable

importance. In many cerebral palsy clinics, this team of three has been joined by the psychologist, the school worker, and the teacher, all working under the guidance of an orthopedic surgeon and pediatrician.

Knowing the speech problem undergone by those cerebral palsied children besides there are still few researchers concerning this matter, the writer is interested in analyzing this phenomenon.

I.2 Statement of the Problem

In relation with phenomenon which has found among cerebral palsied children, the writer states the problem as follows:

- Which phonemes are disordered by cerebral palsied children?

I.3 Objective of the Study

Based on the statement of the problem, this study is intended to find out phonemes which are disordered by cerebral palsied children.

I.4 Significance of the Study

The study is expected to give meaningful contribution to the linguistic studies, especially to phonology, and to give information and description to the readers studying phonology of the cerebral- palsied children.

The study is also expected to be a meaningful information for further study concerning psycholinguistics and neurolinguistics. In Indonesian linguistic field study, there is limited information concerning language of handicapped children,

especially those with cerebral palsy. The writer hopes this study will give some input for speech therapists or special teachers to train the cerebral-palsied students to speak well.

I.5 Theoretical Framework

According to Bowley and Gardner (1980:29-30), there are four main types of cerebral palsy:

1. Spastic.

   This is the largest group about 75 per cent of cerebral-palsied children show spasticity, that is marked by rigidity of movement and an inability to relax their muscles due to damage to the cortex (see the picture) affecting the motor centers. The extent of the handicap varies. In monoplegia, only one arm or leg is affected. In hemiplegia, one side only is affected, the right arm and leg or the left arm and leg. In paraplegia, the legs are only affected, while in quadriplegia (sometimes called diplegia when the legs are more affected than the arms) all limbs are spastic.

2. Athethoid.

   In this condition the child shows frequent involuntary movements which mask and interfere with the normal movement of the body. Writhing movements on the limbs, the face and the tongue, grimacing, dribbling, and slurred speech commonly occur. Hearing defects are fairly common (over 40 per cent) in this group, which interfere with the development of language. Damage to the basal ganglia of the brain appears to be the cause of this condition. Less than 10 per

cent of cerebral palsied children show athetosis (which is sometimes referred to as 'dyskinesia').

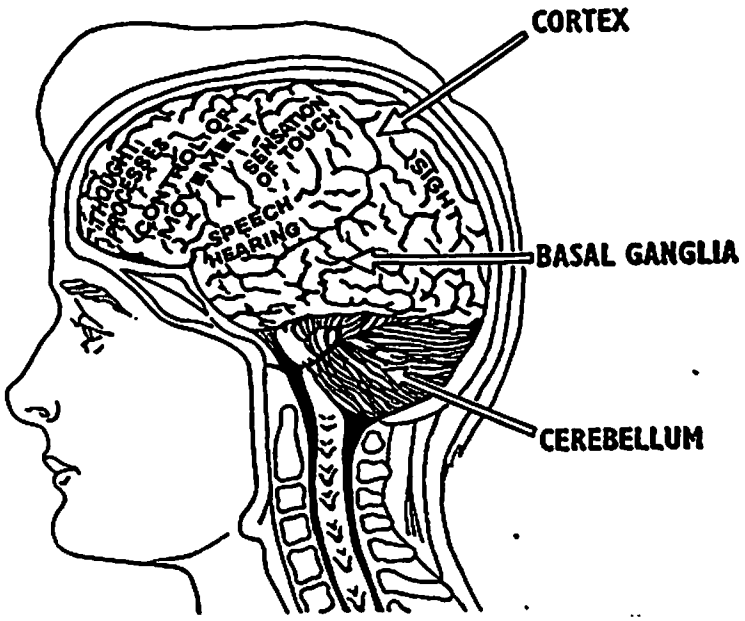
3. Ataxic.

   In this condition the child shows poor body balance, an unsteady gait, and difficulties in hand and eye coordination and control. Injury to the cerebellum is the cause of this type of cerebral palsy, and it is comparatively rare.

4. Mixed and others.

   Nearly 10 per cent show mixed types, that is the combination of spastic and athetoid, or spastic and ataxic, or other combination.

Picture:



According to Crickmay (1972:10) approximately 65 per cent of cerebral palsy cases have some degree of speech difficulties varying all the way from slight articulatory errors to a total inability to move the speech organs sufficiently to say any intelligible words. As could be expected, the type of speech difficulty is largely determined by the particular type of cerebral palsy. The spastic patient, with his excessive muscular tension and his sudden spasms, tends to produce speech that is explosive and punctuated by long pauses. This is what is usually referred to as 'cerebral palsy' speech. In cases where there is severe speech involvement the spastic may become completely "blocked" and unable to move his speech mechanism. The athetoid patient with his overlay of involuntary movements produces speech that is extremely variable. Mild cases may show only slight articulatory errors, while severe ones may be unable to speak at all. Van Riper (Bobath 1972:11) notes that in cases where there are symptoms of both spasticity and athetosis the articulation is apt to be more distorted than if spasticity alone is present. The ataxic patient produces speech that is uncoordinated, slurred, and lacking in rhythm.

Kirk (1962:323) says that the speech of the spastic will show greater articulatory deviations than the speech of the other types. Speech will be **labored** and **indistinct**, and sound will be **omitted, slurred**, or **distorted**, especially consonant blends like *sk* or *tsh*. Pitch changes will be uncontrolled and abrupt rather than gradual and continuous. Vocal quality may be husky, guttural, and tense, may show hypernasality of vowels. Saliva is likely to be excessive in sound formation. The speech of the athetoid usually is slurring in rhythm and constantly

changing in pitch, inflection, effort, and emphasis, not unlike the postural balance. Sounds are distorted inconsistently because of the continuous involuntary movements. The voice may be lacking in force owing to respiratory disturbances and excessive movement. It may be unintelligible because of the irregular movements to which the speech musculature is subjected. The ataxic will talk with the same rhythm shown in his walk and bodily movements. He may give the impressions that he is walking on stilts or as if he were a mechanical doll which has been wound up for motor performance. His speech sounds mechanically motivated also, for it exhibits spasmodic breaks and pauses rather than the slurring and scanning rhythm. At time his speech seem to fade away as if the mechanism needs to be wound up again. Assimilation of sounds and intonational patterns appear to be most difficult.

Rutherford (1944) stated that athethoids are generally able to make movements for speech but few movements are under constant control, that spastic may be limited in the direction and extent of movement but control is consistent, and that the ataxic, who shows mainly defective feedback, does not know whether he has made appropriate movements and is not always certain the movements have taken place.

Other investigators identify the speech characteristics of the cerebral palsied children as follows: (Mysak in Travis, 1968:681-682)

For the spastic children:

- They have difficulty with linguadental, lingua alveolar sounds and fricatives (Clement and Twitchell, 1959). They grave articulatory problems which

reflect the inability to secure graded, syncronous movement of the tongue, lips, and jaw (Berry and Eisenson , 1956:357).

- Their articulation is slow, clumsy, and particularly defective in those vocable that require delicate movements of the intrinsic muscles of the tongue (West, 1957:122).

For the athethoid children:

- Their articulatory problems varying from the extreme of complete mutism or extreme dysarthria to a slight awkwardness in lingual movement (Berry and Eisenson, 1956:358).
- In athethoid, all sounds are articulated poorly, if at all, except at those rare moments when the patient is quiet, and is free from surges of convulsion that sweep over his neuromuscular system, from the labial muscle of articulation to the abdominal muscles of exhalation. In such moments the articulation of the purely athethoid patient is startlingly normal (West, 1957:122).

For the ataxic children:

- They characterized by slurring of articulation which lapses into unintelligibility if speech is continued beyond phrases or short sentences (Berry and Eisenson, 1956:360)
- Ataxic dysarthria is characterized by a lack of consistency in incoordination. Ataxic clumsiness alone may be thought of as a sensory, or afferent, deficiency; when labored scansion appears, it should be regarded as an associative failure.

Curtis E. Weiss, Mary E Gordon, and Herold S. Lilywhite in *Clinical Management of Articulatory and Phonologic Disorders* (1980:88) stated that phonologic disorders is the result of using speech sound incorrectly so that the meaning as affected eventhough the motoric movements can be executed adequately. They also categorize phonologic disorders into four types: **omission, substitution, distortion and addition.** An individual with articulatory deviancies may have one or a combination of these types. **An omission** is an articulatory error in which a phoneme is not produce at a place where one should occur. **A substitution** is a misarticulation in which a standard or non-standard phoneme replaces the correct phoneme. **A distortion** is an articulatory error in which the standard phoneme is modified that it is approximated, although incorrect. Distortion still retains the basic characteristics of the target phoneme. **An addition** is a misarticulation in which a phoneme is added.

Marsono's theory in *Fonetik* (1986:27-100) also used by the writer. He classifies Indonesian vocal into ten types, diphthong into three types, and consonant into eleven types.

Indonesian Vowels

[i]	Depan tinggi atas	ibu, ini, kita, lari
[I]	Depan tinggi bawah	pinggir, kerikil, kelingking
[e]	Depan madya atas	ekor, eja, enak
[ɛ]	Depan madya bawah	nenek, leher, geleng, dendeng
[a]	Depan rendah bawah	ada. apa, pada

[ə]	Tengah madya	emas, sela, iseng, elang
[ɔ]	Belakang madya bawah	otot, tokoh, roti, dorong
[o]	Belakang madya atas	toko, kado, oto, perangko
[U]	Belakang tinggi bawah	ukur, urus, turun
[u]	Belakang tinggi atas	udara, utara, bulan

Indonesian Diphthong

[al]	Diftong Naik Menutup Maju	pakai, tupai, lalai, sampai
[oi]	Diftong Naik Menutup Maju	amboi, sepoi-sepoi
[aU]	Diftong Naik Menutup Mundur	saudara, lampau, surau, pulau

Indonesian Consonants

Bilabial	Moving the tongue and lips together	p, b, m
Labiodental	Lower lip and upper front teeth	f, v, w
Apikodental	Tip of the tongue is raised to the upper teeth	t
Apiko alveolar	Tip of the tongue is raised to alveolar ridge	n, l, r
Apiko palatal	Tip of tongue is raised to the hard palate	d
Lamino alveolar	Tip and blade of the tongue is raised to the alveolar ridge	s, z

Lamino palatal	Tip and blade of the tongue is raised to the hard palate	ʃ
Medio palatal	Middle of the tongue is raised to hard palate	c, j, ɲ, y
Dorsovelar	Back of the tongue is raised to the soft palate	k, g, ŋ , x
Laringal	Glottis in the open position	h
Glotal	Vocal cord are held tightly together	ʔ

I.6 Method of the Study

In doing this study, the writer uses the qualitative descriptive method because the writer wants to describe the phonemes which are disordered by cerebral-palsied children.

I.6.1 Definition of Key Terms

In order to ease the study, the writer gives definition of some terms. They are:

- **Dysarthria**: articulatory disorder caused by poor motor control
- **Cerebral palsy**: injury or damage to a person's brain which has resulted in a difficulty in control of movements.
- **Hemiplegic**: spasticity which involves one side of the body only, with upper extremity frequently more involved.

- **Diplegic**: spasticity which involves the trunk and all four extremities, but the leg more than the arms.
- **Quadriplegic**: spasticity which involves both arms, both legs, the head, and the trunk; oral motor function is commonly affected.
- **Athethoid**: brain damage which causes the involuntary in movement
- **Ataxic**: brain damage which causes lack of consistency in coordination.
- **Phoneme:** a minimal unit that can function to distinguish meaning.
- **Minimal pairs**: pair for knowing when two different forms are identical in every way except for one sound segment that occurs in the same place in the string.

I.6.2 Location and Population of the Study

The location of this study is YPAC Surabaya. The writer chooses this institute because the informant here is representative enough. The selection of the informant is done based on the following criteria:

1. Male and female cerebral-palsied children
2. They speak Indonesian.
3. They are studying at Kindergarten and Elementary School.
4. They are not hearing-impaired children.
5. Their IQs are below 70.

I.6.3 Technique of the Data Collection

The procedures in collecting the data are done by:

1. Choosing object (cerebral-palsied children who are studying at Kindergarten and Elementary School.
2. Making a list of Indonesian words in which consonant and vowels are used in all position; initial, medial, and final position.
3. Requesting the cerebral-palsied students to read or imitate a series of words from a data list.
4. Noting and recording their speech.
5. Transcribing their speech.

I.6.4 Technique of the Data Analysis

The procedures in analyzing the data are done by:

1. Analyzing words which are uttered by cerebral-palsied children based on four types of Phonologic Disorder.
2. Finding out phonemes which are disordered.
3. Making a list both intended and disordered phonemes.
4. Making a conclusion.

BAB II

GENERAL DESCRIPTION OF THE OBJECT OF THE STUDY