BRAIN DAMAGE AND LANGUAGE PRODUCTION: A STUDY ON THE NEUROLOGICAL ASPECT OF LANGUAGE

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Abstract: Brain Damage and Language Production: A Study on the Neurological Aspect of Language. Language is closely related to human being. All human being normally speak at least one language. It is hard to imagine much significant social, intellectual, or artistic activity taking place in the absence of language. The possession of language distinguishes humans from other animals. Even to understand our humanity we must understand the language that makes us human. Language is also connected to brain. It is believed that language is a distinctive piece of biological make up of our brains. In the contrary, if humans have disaster in their brain then automatically that disaster will bring certain negative effects in comprehending and producing language (speech production). This study discusses the relation between brain (biological aspect of language) and language production (linguistic aspect) that is so-called neurolinguistics. The aim of the study is to show the negative effect of damaged brain in comprehending and producing language.

Keywords: brain damage, language production, language disorder, neurolinguistics

Abstrak: Cedera Otak dan Produksi Bahasa: Sebuah Kajian Tentang Aspek Neurologis Bahasa. Bahasa berrelasi erat dengan manusia. Semua manusia normal sekurang-kurangnya berbicara dalam satu bahasa tertentu. Sulit sekali dibayangkan kegiatan penting dalam bidang kehidupan sosial, intelektual, atau kesenian dijalankan tanpa bahasa. Memiliki bahasa merupakan pembeda antara manusia dengan binatang. Bahkan untuk memahami kemanusiaan kita kita harus memahami bahasa bahwasannya bahasa membuat kita menjadi manusia. Bahasa juga dihubungkan dengan otak. Bahkan diyakini bahwa bahasa merupakan bagian khusus yang mendandani otak manusia. Sebaliknya, apabila manusia mengalami bencana dengan otaknya maka dengan sendirinya bencana itu akan membawa pengaruh negatif dalam memahami dan memproduksi bahasa (produksi wicara). Tulisan ini membahas tentang hubungan antara bahasa dengan otak manusia, yang dalam dunia linguistik disebut sebagai neurolinguistik. Tujuan penulisan ini adalah untuk memperlihatkan akibat negatif dari cedera otak pada pemahaman dan produksi bahasa.

Kata Kunci: cedera otak, produksi bahasa, kekacauan bahasa, neurolinguistik

INTRODUCTION

All experts in linguistics have the same agreement that language is an essential part in human existence. They stated that language is many things; it is a system of communication, a medium for thought, a vehicle for literary expression, a social institution, a matter for political controversy, a catalyst for nation building (O'Grady, et al. 1997: 1). All human beings normally speak at least one language and it is hard to imagine much significant social, intellectual, or artistic activity taking place in its absence. Each of us has a stake in understanding something about the nature and use of language. Whatever else people do, when they come together they talk.. Hardly a moment of their waking lives is free from words, and even in their dreams they talk and are talked to. They are the only animals that do talk.

Therefore, language is closely related to human beings. Steven Pinker (1994: 17) stated that "Language is so tightly woven into human experience that it is scarcely possible to imagine life without it." Chances are that if you find two or more people together anywhere on earth, they will soon be exchanging words. When there is no one to talk with, people talk to themselves, to their dogs, even to their plants. Aphasia, the loss of language following brain injury, is devastating, and in severe cases family members may feel that the whole person is lost forever.

Language can distinguishes human from animal. The possession of language, more than any other attribute, distinguishes humans from other animals. In order to understand our humanity we must understand the language that makes us human. According to the philosophy expressed in the myths and religions of many peoples, it is language that is the source of human life and power. We all become "human" because we all come to know at least one language.

Language is closely connected to brain. It is said that language is a distinctive piece of biological makeup of our brains. It is a complex, specialized skill, which develops in the child spontaneously, without conscious effort or formal instruction, is deployed without awareness of its underlying logic, is qualitatively the same in every individual, and is distinct from more general abilities to process information or behave intelligently (Pinker, 1994: 18).When we study human language, we are approaching what some might call the "human essence," the distinctive qualities of mind that are unique to man (Noam Chomsky, *Language and Mind*).

In control of organizing all the more complex physical parts potentially available for sound production is the human brain, which is unusually large relative to human body size. The human brain is lateralized, i.e., it has specialized functions in each of the two hemispheres. Those functions that control motor movements involved in things like speaking and object manipulation are largely confined to the left hemisphere of the brain for most humans. It may be that there is an evolutionary connection between the language-using and tool-using abilities of humans and that both are involved in the development of the speaking brain. All languages, including sign language, require the organizing and combining of sounds or signs in specific arrangements. We seem to have developed a part of our brain that specializes in making these arrangements. Therefore, when brain have problems because of a head injury or stroke, then, it brings problems in comprehending and producing language. It appears in such a case of language disorder.

This study is focused on the relationships between the brain and language production. Positively, language production should be based on the quality of our brain. Left hemisphere is the basic for recognizing and producing language. However, a damage happened in the brain comes to the negative effect in producing and comprehending language. Therefore, the objective of the study is to show the effect of damaged brain in producing and comprehending language. The study based on the theory and practice have been done by certain experts in language (linguistics) and the expert concentrated in the study of biological aspect of language called neurolinguistics.

The way to get the data is by collecting and reading some sources related to the topic. The data collected is analyzed in order to find the connection between brain and language. As the result of the study, the writer includes the types of language disorder as negative effect of damaged brain.

The contents of the study consists of three parts. The first part is introduction that consists of background of the study, the nature of language, and the aim of the study. The second part is about overview on language, i.e., the origins of language, language and brain, and language production and comprehension. The third part is briefly talking about damage in a brain. The last is the types of language disorder as negative effect of damaged brain particularly in language comprehension and production.

THE ORIGINS OF LANGUAGE

We do not know exactly how language originated. We just suspect that some types of spoken language developed between 100.000 and 50.000 years ago, and written language developed about 5.000 years ago. Because of the absence of direct physical evidence, there has been no shortage of speculation about the origins of human speech.

All religions and mythologies contain stories of language origin. Many theories on the origin of language resulted from an interest in human origins and nature. It was believed that language arose together with the human species arose. Thus, language appeared so uniquely human (Fromkin and Rodman, 1988: 413).

The belief in the divine origin of language has continued through the ages. Cotton Mather in Fromkin and Rodman (1988: 413) stated that

"Language is used to bring down the curses of the gods; people offer prayers and converse with their gods in language." In accordance with the Bible he believed that only true God would respond when call upon; the false idols did not know the 'word of God.' In many religions only special languages may be used in prayers and rituals.

Johann Herder (1769), the German philosopher and poet believed that "language and thought are inseparable, and that human must be born with a capacity for both." Language abilities is innate. We cannot talk of human existence before language. Language is part of our essential human nature, and was therefore neither invented nor handed down as a gift. Herder argued that humans have all descended from the same parents, and all languages therefore have descended from one language. This theory is related to the fact that languages, despite their diversity, have universal common properties.

Nowadays the development of language is related to the evolutionary development of the human species. There are views that language ability distinguishes the degree between humans and other primates. The brain mechanism that underlie the language ability are specific to language. All humans are innately or genetically equipped with a unique language learning ability or with genetically determined, specifically linguistic, neurological mechanism.

In trying to understand the development of language, scholars past and present have debated the role played by the vocal tract and the ear. It has been suggested that speech could not have developed in nonhuman primates because their vocal tracts were anatomically incapable of producing a large enough inventory of speech sounds. The development of language is linked to the evolutionary development of the speech production and perception apparatus. This development would be accompanied by changes in the brain and the nervous system toward greater complexity. Such a view implies that the languages of our human ancestors of millions of years ago may have been syntactically and phonologically simpler than any language known to us today.

The major step in the development of language most probably relates to the evolutionary changes in the brain. The hemispheric lateralization played in its development. The attempt to understand what makes language acquisition and use possible has led to research on brain mechanisms and the relationship between the brain and language. The study of this relationship is call neurolinguistics.

LANGUAGE AND BRAIN

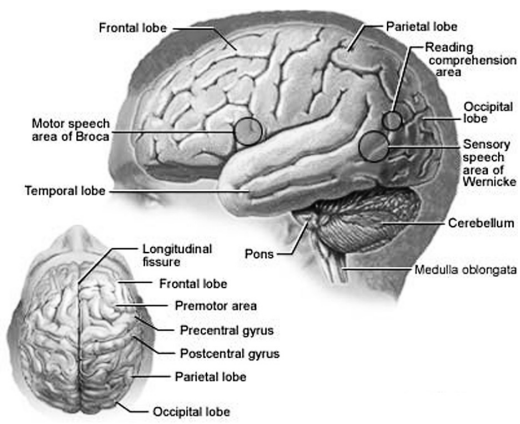
The Brain is the organ of the body in the upper part of the head, which controls thought and feeling. The brain consists of two main parts, the left hemisphere and the right hemisphere. As the brain develops, the different bodily functions such as speech, hearing, sensations, actions, are gradually brought under the control of different areas of the brain. The development of control over different functions in different parts of the brain is known as cerebral dominance or lateralization. Those parts of the brain which control language are usually in the left hemisphere. One area in the left hemisphere is known as Broca's area, or speech center, because it is an important area involved in speech. Damage to this area of the brain leads to different types of Aphasia (loss of the power to use or understand words). Another area called Wernickel's area is thought to be involved in understanding language (Richards, et al., 1997: 41-42).

The brain is the most complicated organ of the body, controlling motor and sensory activities and thought processes. Research conducted for over a century reveals that different parts of the brain controlled different body functions. The attempts to understand the complexities of human cognitive abilities are as old and as continuous as the attempts to understand language. The view that the brain is the source of human language and cognition goes back over two thousand years. Since that time we have learned a great deal about the brain – the most complicated organ of the body. It lies under the scull and consists of approximately ten billion nerve sells (neurons) and billions of fibers that interconnect these sells according to specific and highly selective patterns.

The neurons (gray matter) form the surface of the brain, which is called the cortext. Under the cortext is the white matter, which consists primarily of the connecting fibers. The cerebral cortext is the decision-making organ of the body. It

receives messages from all the sensory organs, and it initiates all voluntary actions. It is the storehouse of memory and the seat of all which is exclusively human in the mind. Somewhere in this gray matter the grammar that represents our knowledge of language resides. The complexity of human brain is shown in the figure below.

Table 1.
Figure of Human Brain
(Figure 3, taken from encognitive.com)



(Figure 3, Human Brain (Source: encognitive.com)

The brain or cerebrum is divided into two parts, called cerebral hemisphere, one on the right and one on the left. These hemispheres are connected like Siamese twins right down the middle by the corpus callosum, consisting of about two million nerve fibers interconnecting selected cortical regions across the midline, permitting the two brains to communicate with each other.

In the early part of the nineteenth century, F.Gall and G. Spurzheim (Fromkin and Rodman, 1988: 401) put forth theories of localization holding that different human abilities and behaviors are traceable to specific parts of the brain. Language is said to be lateralized. Lateralization is the term used to refer to any cognitive functions that are primarily localized to one side of the brain or the other.

Human brain is the most powerful organ of human body. Human brain is divided into two hemispheres, the left and right hemisphere. Language itself is mainly located in the left hemisphere. Sleeper (2007: 9-12) describes that humans' brain contains nearly all neurons they need in a lifetime since they were born and this brain continues to mature. Neurons make connections to each other and these neuronal connections which occur at specialized sites of communication are called synapses. Neurons need to send projection to make synapses with other neurons and when they do this, the projection is surrounded by a fatty substance called myelin. This myelin is beneficial to insulate the projections and protect the electrical signal brought by neurons.

The development of the brain parallels to the development of language skills. By childhood, humans learn to acquire their first language dynamically. By adulthood, when the brain is structured and connectivity is stable and unchanging, humans have difficulty in learning a second language. However, it is not impossible for adults to speak a second language fluently. The cerebral cortex is the outermost region of the brain and it has important functions. Almost of the human brain comprises it and language centers are located here. A structure called the corpus callosum. It is a thick band of fibers which connects the left and right sides of the cerebral cortex.

Sleeper (2007: 27) explains that the surface area of hemisphere can be divided into four major lobes: the frontal lobe, the temporal lobe, the parietal lobe, and the occipital lobe. Language itself relies on the left hemisphere for processing language. The frontal lobe is associated with personality, forward planning, working memory, movement, and the inhibition of inappropriate behaviors. The parietal lobe is associated with visuospatial and sensory processing. The occipital lobe is associated with the processing of visual information. Meanwhile, the temporal lobe is associated with the processing of language, memory, and sounds.

Humans'left hemisphere consists of two different areas: Broca's and Wernicke's area. Broca's area, located in the left frontal lobe of the brain, is particularly important for producing speech, while Wernicke's area, located in the temporal lobe, is particularly important for dealing with meaning of words. In the case of the two hemispheres, Sleeper (2007: 29) explains that the central portion of Broca's area governs articulation of speech, while the upper portion of this region contributes to comprehension

of the meaning of words. On the other hand, Wernicke's area contributes to comprehension of incoming language, whether spoken words, written words, or sign language. It is also critical for proper formation of speech.

Although Broca's and Wernicke's areas are indeed important for language, Sleeper (2007: 32-35) argues that there are additional neocortical and subcortical areas which are also involved in processing and comprehending speech and language. In the frontal lobe, areas called the motor cortex and the motor association cortex contribute to speech production. The motor cortex is beneficial in muscle movements, while the motor association cortex coordinates movements, including lip movements required for speech. In temporal lobe there are the auditory cortex and the auditory association cortex which allow humans to interpret the sounds that they hear and finally give feedback. The auditory cortex is the general area where the processing of sound quality occurs, while the auditory association cortex is involved in making sense of sounds. Another cortex which is critical in processing language is the visual cortex, which lies in the occipital lobe. This region is necessary for reading and writing language. The last area is angular gyrus, in the edge of the parietal lobe. It is responsible for recognition of visual symbols, such as the letters and punctuation marks .It is clear then why brain is very crucial in processing language. Damage in particular areas of brain can lead to disrupted language because the means of processing language is damaged. This phenomenon is commonly called language disorder.

LANGUAGE COMPREHENSION AND PRODUCTION

Spoken Language and Written Language

Written Language and Spoken Language differ in many ways. However, some forms of written language, such as instant messages and email, are close to spoken language. Written language tends to be more complex and intricate than speech with longer sentences and many subordinat clauses. The punctuation and layout of written texts also have no spoken equivalent. Spoken language, on the other hand, tends to be full of repetitions, incomplete sentences, Corrections and interruptions, with the exception of formal speeches and other scripted forms of speech, such as news reports and scripts for plays and films.

The main difference of written language and spoken language is that most written language is intended to be read by someone who is separated from the writer in space and time. Therefore, to communicate successfully, it has to be a lot more explicit than spoken language used in a face to face conversation, because the reader cannot ask the writer for clarification. Although some written genre such as texts and email are very similar to spoken language, in general written language is more dense (more content words in a smaller space), uses more subordinate clauses and has less redundancy.

Written language is governed by diction, grammar, structures, etc., but not pronunciation. It is more standardized and more universal; whereas spoken language is more "dialect" where pronunciation of the words can be different from one region to another. Written language goes with "spellings" while spoken language goes with "pronunciations" or "sounds". In other words, some grammatical errors can be condone in spoken language, but in written language you must be penalized for errors.

Language Comprehension

Language comprehension is the processes involved in understanding the meaning of written or spoken language (Richard, et al. 1998: 200). According to Scovel (1998: 50), language comprehension is an ability to understand language either in spoken or printed form. In spoken words, phonemes of a spoken word activate a set of word candidates which are consistent with the input. These candidates compete with one another for activation. Since more acoustic input is analyzed, candidates that are no longer consistent with the input were dropped out of the set. This process continues until only one word candidate matches the input. Thus, people will comprehend spoken words.

On the other hand, when people read, they use visual representations that are provided by print to recover the phonological and linguistic structure of the message. Moreover, readers

must quickly decide whether a printed sentence makes sense or not. Readers with normal hearing and without any brain damage will be able to comprehend speech uttered or written. Moreover, they will be able to detect any errors made.

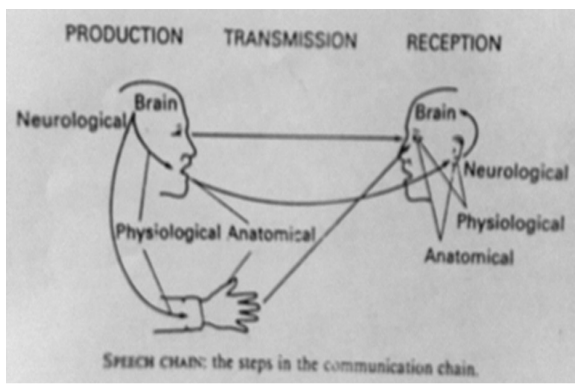
Theories of language comprehension are an important aspect of psycholinguistics, cognitive psychology, and second language acquisition. Among the different process involved are perceptual processing, parsing, and utilization or elaboration. In *perceptual processing*, attention is focused on the oral or written text and parts of it are retained in short term memory; in *parsing*, words are identified and matched with representations in long term memory creating basic units of meaning called preposition.; and in *utilization* or *elaboration*, propositions are related to other information and concepts in long term memory and connections are formed with existing concepts and schema.

Language Production

Language production is the process involved in creating and expressing meaning through language. (Richars, et al. 1998: 203). Numerous theories in psycholinguistics and cognitive psychology attempt to account for the different process involved in language production. Among the different stages involved are construction, transformation or articulation, and execution. In *Construction*, the speaker or writer selects communicative goal, and creates propositions which express intended meaning; in *transformation* or *articulation*, meanings are encoded in linguistic form according to the grammar of the target language; and in *execution*, the message is expressed in audible or visible form through speech or writing.

Furthermore, Griffin and Ferreira in Traxler and Gernsbacher (2006: 22) stated that "the simplest meaningful utterance that people produce consists of a single word which expresses a single idea." Generally, a speaker begins to specify semantic and pragmatic properties to produce a word which expresses the situation. This process is called conceptualization or message planning. He or she, then, selects a word which involves selecting a word in his or her vocabulary memory based on its correspondence to semantic and pragmatic specifications. After selecting the word that will express the thought, the speaker comes to sound processing stage. This stage involves constructing the phonological form of a selected word. Then the speaker tries to retrieve individual sounds of the word and manage them into stressed and unstressed syllables. The two stages are called formulation because the speaker determines how to express his or her thought. The final process is articulation in which motor programs are used to pronounce the sounds of a word. These two processes are shown in the diagram below.

Table 2.
The diagram of Speech Production and Reception.



SPEECH CHAIN: the steps in the communication chain.

BRAIN DAMAGE

Two Sides of the Brain

In 1836 Marc Dax presented a short report at a medical society meeting in Mompellier, France. Dax was struck by the fact that, of the 40s brain damaged patients with speech problems whom he had seen during his career, not a single case had damaged restricted to right hemisphere. His report aroused little interest, because his contemporaries believed that the brain acted as a whole and that specific functions could not be attributed to particular parts of it. Dax died the following year, but he was the first one studied one of the most important areas of neuropsychological research.: the study of lateralization of function (Pinel, 1993: 538). In 1861, 25 years after Dax died, Paul Broca reported his postmortem examination of two aphasic patients. Aphasia refers to brain-damage-produced deficits in the ability to produce or comprehend language.

Since the middle of the nineteenth century, there has been a basic assumption that it is possible to find a direct relation between language and the brain, and a continuous effort to discover direct centers where language capacities (competence and performance) may be localized. In the early part of the nineteenth century, F. Gall and G. Spurzheim (Fromkin and Rodman, 1988: 401) put forth theories of localization, holding that different human abilities and behaviors are traceable to specific parts of the brain. Language is said to be lateralized. Lateralization is the term used to refer to any cognitive functions that are primarily localized to one side of the brain or the other.

Aphasia studies provide unequivocal evidence that language is predominantly and most frequently a left-hemisphere function. Aphasia is the neurological term used to refer to any acquired (as opposite to developmental) language disorder that follows a focal (localized) brain lesion caused by a stroke, a tumor, a gunshot wound, or an infection (Fromkin and Rodman: 402). In the great majority of cases, lesions to the left hemisphere result in aphasia but injuries to the right do not.

Split Brains Research

It is evidence that language is primarily processed in the left hemisphere. If the right hemisphere is cut out (in a research on aphasia), language remains intact, although other cognitive losses may result. "Split-brain" patients provide important evidence for language lateralization and for understanding brain functions. It was found that persons suffering from serious epilepsy could be treated by cutting the corpus callosum. Between the two brain halves consists of two million fibers connecting the cells of the left and right hemispheres. When this pathway is split there is no communication between the 'two brains'. The psychologist Michael Gazzaniga (1970) in Fromkin and Rodman (1988: 407) states: "with (the corpus callosum) intact, the two halves of the body have no secrets from one another. With it sectioned, the two halves become two different conscious mental spheres, each with its own experienced base and control system for behavioral operations……. Unbelievable as this may seem, this is the flavor of a long series of experimental studies first carried out in the cat and monkey."

When the brain is split surgically, certain information from the left side of the body is received only by the right side of the brain and vice versa. Person with split brains have been tested by psychologist, showing that the two human hemispheres are distinct. Various experiments of this sort have been performed, all providing information on the different capabilities of the 'two brains." 1) the right brain does better than the left in pattern-matching tasks, in recognizing faces, and in spatial orientation. 2) The left hemisphere is superior for language, for rhythmic perception, for temporal-order judgments, and for mathematical thinking. 3) According to Gazzaniga, "the right hemisphere as well as the left hemisphere can emote and while the left can tell you why, the right cannot." (Fromkin,and Rodman: 409).

Studies of human split-brain patients have shown that when the interhemispheric visual connections are severed, visual information from the right and left visual fields become confined to the left and right hemispheres respectively. Because of the crucial endowment of the left hemisphere for language, written material delivered to the right hemisphere can not be read if the brain is split, because the information can not be transferred to the left hemisphere. An image or picture that is flashed to the right visual field of a split-brain patient can be named. However, when the picture is flashed in the left visual field and lends in the right hemisphere, it cannot be named.

Damaged Brains (Altmann, 1997: 182-185)

The two most common causes of cell death in the brains of otherwise healthy adults are stroke and head injury. A stroke occurs when a blood vessel in the brain becomes blocked by a clot, or burst because of a weakening of its walls. In either case, nearby cells die because of a failure in the blood supply and in the case of rupture, the physical damage that is caused by the leaked blood. Often, stroke leads to quite localized areas of cell death. Head injury generally leads to more widespread cell death, but the effects of both stroke and head injury can none the less be quite similar. They include impairments of one or more of the following: movement and/or sensation, vision, memory, planning and problem solving, and language. There may also be marked effects on mood and personality.

As explained previously, the two halves of the brain control different sides of the body – the left hemisphere controls the right side of the body, and the right controls the left. The two hemispheres are connected, and generally split the workload – except in the case of language, where the left hemisphere has primary responsibility. Consequently, a language deficit is a good pointer to left-hemisphere damage, and more specifically, to damage to the left side of that hemisphere.

Damage to the right hemisphere rarely causes any language impairments of the kind that arise following left-hemisphere damage. However, right-hemisphere damaged patients may fail to recognize whether a speaker is happy, sad, surprise, or angry on the basis of his or her tone of voice. They may themselves be unable to convey such feelings by voice alone, and their speech can sound quite 'mechanical' as a consequence. This is not just a general deficit in their ability to recognize changes in tone or pitch – some patients can tell on the basis of such differences alone whether a sentence such as 'She's not coming to the party' is intended as statement, a command, or a question. What is impaired in this cases is not, primarily, the language faculty.

The fact that impairments specific to the language faculty are associated with damage to a part of the left hemisphere leads to the natural suggestion that part of the brain is specialized for language.

Most patients with a deficit in producing language will have some kind of deficit in comprehending language and vice versa. Many patients who have a deficit in their spoken language will also have a deficit in their written language. Deficits which affect spoken language are called *aphasias*. Deficits affecting the ability to understand written language are called *dyslexias* (Atmann, 1997: 185).

LANGUAGE DISORDER

The most common way to communicate is by talking. It seems that the act of talking to express what human thinks is easy since it is effortless. They think of what they want to say and then say it. However, it is actually produced by completely difficult movements of the head, neck, chest, and abdomen. An injury or defect on these sites can affect normal speech. Therefore, for some people the act of vocalizing their thoughts and produce them in sounds is not easy. The number of people afflicting from language disorder is quite outstanding.

Language disorder is the inability of humans to speak properly. Disorder itself may due to genetic or developmental problems and others due to brain damage. The term speech and language disorders often occur together that make it almost impossible to distinguish the two terms. Lanier (2010: 11) defines language disorders as "having inability to understand, form, or use words correctly. They can occur in both verbal and nonverbal communication." People are suffering from language disorder know exactly what they want to say and how to use language in any appropriate condition. However, they have difficulties in producing the sounds to communicate effectively. Their difficulties may range from being unable to pronounce a specific letter or sound to inability to produce understandable speech. However, there are also some sufferers of language disorder who do not understand what utterances they have produced. This severe condition attacks either children or adults. An individual who suffers from language disorder is sometimes treated to be mentally inferior even though he or she has high intelligence. Moreover, many people who live with a speech disorder suffer from depression due to a poor self-image.

There are some types of language disorder, those are called stuttering, aphasia, cluttering, autism, lisp, dysarthria, apraxia, dysgraphia, and dyslexia ((Sleeper, 2007: 69-90). These types of language disorder are briefly explained as follows.

Stuttering (=gagap)

Stuttering is a speech disorder which disturbs fluency by repetitions and prolongations in syllables, sounds, and words. Stuttering is also called stammering. A person who suffers from stuttering has difficulty in starting words because of disruption in respiration, vocalization, and articulation which involves the throat, palate, tongue, lips, and teeth. Stuttering occurs when there are disruptions in the way that the brain coordinates with the various components which

is necessary for speech production. An individual who suffers from this disorder feels a strain in speaking. Thus, he/she may avoid some words that are regarded difficult to be pronounced.

Aphasia (=afasia)

Aphasia derived from German word "aphatos" means unuttered. Aphasia is a partial loss of the ability to articulate and comprehend language. Aphasia in phonology is a total or partial loss of the power to use or understand words, usually caused by brain disease or injury. The sufferers may have difficulty in expressing language (speaking), comprehending language (comprehension), or both. The severity of this illness depends on the location and extent of damage. Aphasia may improve and get worse over time, but it is sometimes permanent. Field (2004: 16) argues that usually it results from brain damage whether caused by an accident, a stroke, invasive surgery, or the effects of dementia. There are two types of aphasia. The first type is Broca's Aphasia, which is inability to produce language. The sufferers may have poor articulation that makes the speech effortful with many hesitations. Thus, an individual who suffers from this illness can comprehend language but is not able to produce speech. The second type is Wernicke's Aphasia. Wernicke's Aphasia is just the opposite of Broca's Aphasia. The sufferer has problems in retrieving vocabulary, thus makes them speak inappropriate nouns and verbs. This illness does not affect the sufferers to be unable to speak because they have syntactically complex and well structured speech, containing function words and correct affixation. It is regarded as nonsense speech or double-talk.

Cluttering (=kacau)

Another language disorder is cluttering, which shares some characteristics with stuttering but still differs in many important aspects (Ward, 2006: 157). Field (2004: 61) says that it affects the fluency in which the sufferer tends to speak too quickly, resulting in distorted articulation and disrupted rhythm. Moreover, syllables may be truncated, words are repeated, and sounds are omitted or misarticulated. The sufferer may well speed up speaking rather than slowing down. Cluttering is a syndrome characterized by a speech delivery which is either abnormally fast, irregular or both.

Autism (=autisme)

Autism refers to a spectrum of developmental disorders characterized by social interaction deficits, language/communication impairments, abnormality, and stereotyped behavior patterns (Sleeper, 2007: 94-95). The result of this illness is that the sufferer is often mute and uses uncommunicative language. Field (2004: 27) characterizes autism as a withdrawal from linguistic interaction with others. The symptoms appear between the ages of one and three. The syndrome of autism is more common in males than in females and appears to be caused by a physical dysfunction of the brain. Since autistic children with draw language, it is possible that they hate human language. The sufferer's pronunciation of phonemes is generally unimpaired but the intonation and rhyme may be flat and monotonous. Another aspect of language, the processing of meaning, may deviate because autistic children are unable to make links between knowledge and linguistic experience. Autistic children may have low IQ but they may have excellent skills such as painting and music.

Lisp (=pelat, tèlor)

Lanier (2010: 24) defines lisp as an articulation disorder in which the sufferer mispronounces the letter "s" and "z." in English or the letter "r" in Indonesian. For example, a person may say "ɣɛθ" instead of "yes" or "θɛt" instead of "sat" (English), or "telul" instead of "telur" (Indonesian). In extreme cases, the sufferer's tongue may protrude from the mouth during the formation of certain letters like when producing a soft "th" sound. According to Lanier (2010: 26), lisp can happen because of some factors such as defects in the teeth or structure of the mouth, cleft palate, or hearing loss. Moreover, an unconscious imitation of other lispers may also contribute to the presence of a lisp. People with this speech error feel it as a source of embarrassment.

Dysarthria (=disartria)

Lanier (2010: 28) defines dysarthria as a difficulty in articulating speech because of weakening or disfunction of the muscles of the

mouth, face, and/or respiratory system, specifically due to brain injury. Thus, speech affected by this illness is slow, slurred, and difficult to understand due to errors in the articulation of consonants. Sleeper (2007: 85) proposes some symptoms of this illness such as slurred speech; speaking softly or barely in a whisper; slowed or fastened speech, mumbled speech; restricted movement of the tongue, lips, and jaw; abnormal rhythm of speech; or altered vocal quality (the speaker may sound stuffy, nasal, hoarse, or breathless). Dysarthria does not disturb an individual's ability to comprehend language or to form coherent expressions.

Apraxia (=apraksia)

Apraxia is a disturbance of ability to control the motor programming involved in an activity such as the articulation of speech (Field, 2004: 18). It is a motor speech disorder caused by damage to the parts of the brain which is responsible for speaking. Apraxia may also be illustrated as an articulation, fluency, or voice disorder, or a combination of the three. According to Lanier (2010: 30), people with this illness have some difficulties in saying what they want to say correctly and consistently. Therefore, sometimes they say differently from what they intended. Moreover, they face trouble with the rhythm and timing of speech.

Dysgraphia (=disgrafia)

Many people have poor handwriting, but dysgraphia is more serious. The term dysgraphia sometime is associated with dyslexia, although it is possible for having reading impairment without writing impairment and vice versa. Dysgraphia is a learning disability as a result of difficulty in expressing thoughts in writing and graphing. Generally, the characteristics of dysgraphia are reversing letters or numbers, writing words backwards, writing letters out of order, and having very sloppy handwriting. Therefore, these difficulties make the child write slowly avoiding errors. However, it makes him stuck. Learning process of writing in English undergoes three stages, i.e. imitative, phonological, and orthographic. Dysgraphia may occur in phonological stage because the sufferer cannot change the speech signal into phonemes. Moreover, the sufferer is unable to match phoneme to graphemes and develop a sufficient grapho-phonological system. Consequently, he or she cannot guess the spelling of the spoken words. Dysgraphia may also happen in orthographic stage when the sufferer is unable to change the phonological spelling into the words.

Dyslexia (=disleksia)

Dyslexia is a general term sometimes used to describe any continuing problem in learning to read, such us difficulty in distinguishing letter shapes and words. That is why, dyslexia is also called word blindness (Richard, et al. 1997: 118). Dyslexia has recently been categorized as developmental language disorder. Moreover, Mather and Wendling (2012:11) describe dyslexia as a specific learning disability that is neurological in origin; it is characterized by difficulties with acurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduce reading experience that can impede growth of vocabulary and background knowledge.

There are three cognitive aspects of dyslexic children such as hearing, vision and attention. Physically children with dyslexia look normal. Dyslexia is not limited to the inability of a person to compose or read sentences in reverse order but also in various sequences including top to bottom, from left to the right and difficult to accept commands that should be continued to the memory of the brain. This is often cause the dyslexic children is not concentrate in some ways. Dyslexic children are different from each other. The only thing in common with them is a very low reading ability seen from the age and the intelligence they have.

In oral language children with dyslexia are late in learning to talk, difficulty in pronouncing words, in acquiring vocabulary or using age appropriate grammar, difficulty in following directions,

confusion with before/after, right/left, and so on; difficulty in learning the alphabet, nursery rhymes, or songs, difficulty in understanding concepts and relationships, difficulty with word retrieval or naming problems. Moreover, in reading case children with dyslexia have difficulty in learning to read, identifying or generating rhyming words, or counting syllables in words (phonological awareness), difficulty in hearing and manipulating sounds in words (phonemic awareness), difficulty in distinguishing different sounds in words (phonological processing), difficulty in learning the sounds of letters (phonics), difficulty in remembering names and shapes of letters, or naming letters rapidly, transposing the order of letters when reading or spelling, misreading or omitting common short words, "stumbles" through longer words, poor reading comprehension during oral or silent reading, often because words are not accurately read, slow, laborious oral reading.

In written language children with dyslexia have difficulty in putting ideas on paper, many spelling mistakes, may do well on weekly spelling tests, but may have spelling mistakes in daily work, difficulty in proofreading. Besides, there are other common symptoms that occur with dyslexia, such as difficulty in naming colors, objects, and letters rapidly, in a sequence (RAN: Rapid Automatized Naming), weak memory for lists, directions, or facts, needs to see or hear concepts many times to learn them, distracted by visual or auditory stimuli, downward trend in achievement test scores or school performance, inconsistent school work, etc.

CONCLUSION

Human brain is the most powerful and complicated organ of human body. It functions to control thought and feeling. Human brain consists of two main parts called the left hemisphere and the right hemisphere. These two main part hemispheres are similar in form but different in function. The different bodily functions such as speech, hearing, sensations, actions are gradually brought under the control of different areas of the brain.

Different parts of brain controlled different body function. The two halves of the brain control different sides of the body. The left hemisphere controls the right side of the body, and the right hemisphere controls the left side of the body. The two hemispheres are connected, and generally split the workload – except in the case of language, where the left hemisphere has primary responsibility. Those parts of the brain which control language are usually in the left hemisphere. One area in the left hemisphere is known as Broca's area, or speech center, because it is an important area involved in speech. Damage to this area of the brain leads to different types language disorder. Another area called Wernickel's area is thought to be involved in understanding language.

The two most common causes of cell death in the brains are stroke and head injury. Damage to the right hemisphere rarely causes any language impairments of the kind that arise following left-hemisphere damage. Right-hemisphere damaged patients may fail to recognize whether a speaker is happy, sad, surprise, or angry on the basis of his or her tone of voice. The fact that impairments specific to the language faculty are associated with damage to a part of the left hemisphere leads to the natural suggestion that, that part of the brain is specialized for language.

Most patients with a deficit in producing language will have some kind of deficit in comprehending language, and vice versa. Many patients who have deficit in their spoken language will also have a deficit in their written language. Deficit which effect spoken language are called aphasias, and deficit affecting the ability to understand written language are called dyslexias. Language disorder is the inability of humans to speak properly. Disorder itself may due to genetic or developmental problems and others due to brain damage. People are suffering from language disorder know exactly what they want to say and how to use language in any appropriate condition. However, they have difficulties in producing the sounds to communicate effectively. Their difficulties may range from being unable to pronounce a specific letter or sound to inability to produce understandable speech. Some types of language disorder presented in this writing are called suttering, aphasia, cluttering, autism, lisp, dysarthria, apraxia, disgraphya, and dyslexia.

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