LANGUAGE AND BRAIN

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Objectives:

- Understanding the role of brain in human communication
- Exploring the development phases of brain
- Explaining the relation between brain and language
- Explaining the nature of aphasia and its types

Instructions:

- Read the following section on brain and language (Source: Chapter 5, Indah, R. N. & Abdurrahman. 2008. *Psikolinguistik: konsep & isu umum.* Malang: UIN Press.)
- What is the relation between brain and language? Elaborate your answer using example(s).
- Explain the nature of neurolinguistics.
- What is aphasia? Explain the difference between Broca and Wernicke's aphasia.
- Read the class notes on Aphasia.
- What do you know about the tools or treatment for aphasics?
- Read text 3 on Anomic and Global Aphasia
- Do you think that difficulty in memorizing and labeling the names of things suffered since childhood also belongs to anomic aphasia? Why
- Global aphasia does not affect the intelligence. What does it mean? Can people who experience global aphasia get their ability again?
- Do you think that bilingual anomic aphasia can affect one's mother tongue?
- Write a one page summary on brain and language.

Source: Chapter 5, Indah, R. N. & Abdurrahman. 2008. *Psikolinguistik: konsep & isu umum*. Malang: UIN Press.

Manusia dalam proses berbahasa dimulai dari fase enkode semantik, enkode gramatika, enkode fonologi, yang kemudian dilanjutkan dengan decode fonologi, dekode gramatika, serta diakhiri dengan dekode semantik. Proses enkode semantik dan enkode gramatika terjadi dalam otak penutur, sedangkan enkode fonologi dimulai dari otak penutur yang kemudian dilaksanakan oleh alat ucap (*articulator*) di dalam rongga mulut penutur. Berbeda dengan dekode fonologi dimulai dari telinga pendengar dengan lanjutannya berupa dekode gramatika dan berakhir pada dekode semantik. Apabila alat-alat fisiologi penutur dan pendengar berada dalam keadaan sehat-normal, maka pesan semantik yang dikirimkan oleh penutur dapat diterima dengan baik oleh otak pendengar, dan proses berbahasa berjalan dengan baik dan normal.

Karena proses berbahasa lebih bersifat dua arah, bersifat bolak balik antar penutur dan pendengar, maka seorang penutur kemudian bisa menjadi pendengar, dan seorang pendengar kemudian bisa menjadi penutur. Begitulah proses tersebut terjadi bergantian, yang secara teoretis berjalan terlalu lama dan panjang, namun sebenarnya dapat berlangsung dalam waktu singkat dan cepat. Semua proses ini dikendalikan oleh otak yang merupakan alat pengatur dan pengendali gerak semua aktivitas manusia.

A. Evolusi Otak Manusia

Dalam perkembangannya manusia tumbuh secara gradual dari suatu bentuk ke bentuk yang lain selama berjuta-juta tahun. Salah satu pertumbuhan yang telah diteliti oleh para ahli palaeneurologi telah menujukkan bahwa evolusi otak manusia primata *Austrolopithecus* sampai dengan manusia saat ini telah berlangsung sekitar 3 juta tahun. Hal ini tampak paling tidak pada ukuran otak yang telah membesar dari 400 miligram menjadi 1400 miligram pada kurun waktu antara 3-4 juta tahun lalu. Dari munculnya Homo Erectus sampai dengan adanya homosapiens pada sekitar 1,7 juta tahun yang lalu ukuran otak manusia telah mengalami perkembangan hampir

dua kali lipat, dari 800 miligram ke-1. 500 miligram. Meskipun ukuran ini itu sendiri bukanlah satu-satunya indikator untuk mengukur perubahan fungsi, paling tidak ukuran ini memungkinkan akan adanya fungsi yang bertambah.

Selanjutnya perkembangan otak manusia dapat dibagi menjadi empat fase. Fase pertama adalah fase perkembangan ukuran seperti yang telah dikatakan di atas. Fase ini tampak pada Homo Erectus yang ditemukan di Jawa serta yang ditemukan di China. Fase kedua adalah adanya perubahan reorganisasi pada otak tersebut. Lembah-lembah pada otak ada yang bergeser sehingga memperluas daerah lain seperti daerah yang dinamakan parietal. Perubahan ini terjadi pada masa praaustrolopithecus ke Austrolopithecus afarensi. Perubahan ketiga adalah munculnya sistem fiber yang beda-beda pada daerah tertentu melalui *Corpus Callosum*. Fiber-fiber ini dapat diibaratkan sebagai kabel listrik yang memberikan aliran-aliran elektrik untuk menggerakkan atau melakukan sesuatu. Perkembangan keempat adalah munculnya dua hemisfer yang asimetris, yakni hemisfer kanan yang mengatur motorik sisi kiri tubuh serta berperan dalam emosi dan kemampuan, dan hemisfer kiri yang mengatur motorik sisi kanan tubuh. Dua fase terakhir ini terjadi pada saat perubahan dari Homoerectus ke Homo Sapiens.

Berdasarkan gambaran singkat tersebut, tampak jelas bahwa otak manusia telah mengalami evolusi dari yang paling sederhana ke yang paling rumit seperti pada otak manusia saat ini.

B. Neurolinguistik

Pada awalnya hubungan antara bahasa dan otak ditengarai dari adanya kerusakan pada otak yang mempengaruhi kemampuan berbahasa. Hal ini dikemukakan oleh Edwin Smith, ilmuwan Amerika, yang menemukan lembar papirus pada tahun 1862 yang menyebutkan adanya 48 kasus yang terjadi pada tahun 3000 SM. Kasus ke-22 menjelaskan tentang kerusakan otak akibat cidera kepala yang mengakibatkan hilangnya kemampuan berbicara. Inilah yang pada akhirnya disebut *aphasia* dan *dysatrhria.* Istilah terakhir mengacu pada ketidakmampuan

mengartikulasikan ucapan akibat gangguan neuromotor berbicara (Gleason dan Ratner 1998).

Perihal bagaimana otak manusia menghasilkan dan memproses bahasa dikaji dalam neurolinguistik sebagai perkembangan dari psikolinguistik. Dalam hal ini yang perlu diangkat bukanlah perbedaan pengaruh otak kanan dan otak kiri pada perilaku manusia, melainkan bagaimana secara anatomis hemisfer kanan dan kiri bekerjasama dalam mengolah informasi kebahasaan. Inilah yang menjadi fungsi utama *corpus callosum* yang menjadi panel penghubung kedua sisi hemisfer (Schovel, 2004).

Untuk komunikasi linguistik pada bagian *cortex* otak dikenal dua area yang dinamakan area Broca dan Wernicke. Paul Broca, ilmuwan Prancis, yang juga sebagai penemu istilah *aphasia,* hilangnya kemampuan berbicara atau berbahasa akibat cidera otak, menamai area dasar *motor cortex* yang mempengaruhi kefasihan berbicara. Kerusakan pada area Broca berakibat pada kemunduran kemampuan baca tulis, keraguan berbicara dan bahkan pada beberapa kasus muncul gagap. Namun demikian kemampuan memahami bahasa tidak bermasalah. Apabila cidera otak terjadi pada bagian belakang telinga, yaitu pada area Wernicke, akibatnya akan berbeda. Karl Wernicke, penerus Broca yang berasal dari Austria, meneliti dampak cidera pada *sensory cortex.* Penderitanya akan mengalami kesulitan dalam mengolah masukan linguistik meskipun secara umum kemampuan baca tulis tidak terlalu terpengaruh. Penderita Wernicke's aphasia lebih fasih daripada penderita Broca's aphasia, namun demikian cara bicaranya cenderung bergumam dan tidak jelas ke mana arah pembicaraan yang dimaksudnya.

Cidera pada otak berakibat fatal terhadap perkembangan dan kemampuan berbahasa. Adanya kelainan dalam sistem otak yang kompleks dipelajari dalam relasi neuropatologi dan gangguan komunikasi. Gleason dan Ratner (1998) menjelaskan bahwa terdapat penyebab cidera otak selain kecelakaan yaitu karena adanya penyakit *cerebrovascular* yang membunuh jaringan saraf dan memotong aliran darah ke otak yang membutuhkan suplai glukosa dan oksigen. Penyakit lainnya yaitu trauma, tumor dan *hydrosephalus* yang menggerogoti jaringan saraf sehingga fungsinya terganggu. Penyakit lain seperti *multiple sclerosis* mengikis lapisan *myelin* pada otak sehingga

hubungan antar saraf terganggu. Penyakit Hutington dan Parkinson juga muncul akibat ketidaksingkronan hubungan antar saraf. Relasi antara cidera otak dan gangguan berkomunikasi ditunjukkan pada tabel berikut.

Tabel Jenis Neuropatologi dan Jenis Gangguan Berkomunikasi

Jenis Neuropatologi	**Jenis Gangguan Berkomunikasi**
Penyakit *Cerebrovascular (hemorrhage, aneurysm, arteriovenous malformation)*	*Aphasia, dysathria, dementia*
Penyakit degeneratif (*Alzheimer, Pick)*	*Dementia*
Trauma di kepala	*Aphasia, dysathria,* kebingungan berbahasa
Parkinson	*Dementia, dysathria*
Multiple Sclerosis	*Dysathria*
Hidrosefalus	*Aphasia*
Tumor	*Aphasia* dan/atau *dysathria*
Huntington's chorea	*Dementia* dan/atau *dysathria*
Ataxias hereditas	*Dysathria*
Amyotrophic lateral sclerosis	*Dysathria*
Myasthenia gravis	*Dysathria*

Cidera pada otak sebagaimana yang dijelaskan di atas mengarah pada hilangnya kemampuan berbahasa. Kompleksitas bahasa manusia tercermin dari munculnya beberapa anomali komunikasi seperti yang dicontohkan pada tabel di atas.

Selain itu, dalam neurolinguistik telah dikaji bahwa kemampuan berbahasa sangat dipengaruhi oleh kemampuan otak memproses informasi. Sebagaimana yang dibuktikan dalam beragam *aphasia,* kemampuan berbahasa lebih banyak dipengaruhi hemisfer kiri. Namun dari beberapa bukti keberhasilan operasi otak ternyata dapat disimpulkan bahwa kemampuan berbahasa dan berbicara tidak mutlak terpusat pada satu area sisi otak. Pada anak kecil, awalnya fungsi kebahasaan dikendalikan oleh

kedua belah hemisfer. Dalam perkembangannya kendali itu akan menyempit sehingga lebih cenderung memaksimalkan fungsi kebahasaan dari salah satu hemisfer baik itu kanan maupun kiri.

Hilangnya kemampuan berbahasa lebih lanjut akan dibahas secara rinci dalam bab gangguan berbahasa. Dari keseluruhan kasus ketidakmampuan berbahasa muncul kecenderungan yang mengarah pada salah satu aspek perilaku manusia, yaitu yang disebut kognisi atau kemampuan berpikir. Oleh karena itu, dapat ditarik benang merah bahwa kemampuan dan ketidakmampuan berbahasa terkait dengan peranan otak yang mengacu pada relasi antara bahasa dan pikiran manusia sebagaimana yang menjadi fokus kajian dalam psikolinguistik.

Kesimpulan

- Peran otak dalam komunikasi manusia terletak dalam pengendalian dan pengaturan proses berbahasa yang bersifat dua arah, bersifat bolak balik antar penutur dan pendengar. Hal ini yang memungkinkan seorang penutur kemudian bisa menjadi pendengar, dan seorang pendengar kemudian bisa menjadi penutur. Proses tersebut terjadi bergantian, yang secara teoretis berjalan terlalu lama dan panjang, namun sebenarnya dapat berlangsung dalam waktu singkat dan cepat karena dikendalikan oleh otak.
- Fase perkembangan otak manusia terbagi menjadi empat. *Pertama* fase perkembangan ukuran yang tampak pada homo erectus yang ditemukan di Jawa serta yang ditemukan di China. *Kedua* adalah adanya perubahan reorganisasi pada otak yang terjadi pada masa praaustrolopithecus ke Austrolopithecus afarensi. *Ketiga* adalah munculnya sistem fiber yang beda-beda pada daerah tertentu melalui *Corpus Callosum. Keempat* adalah munculnya dua hemisfer yang asimetris, yakni hemisfer kanan yang mengatur motorik sisi kiri tubuh serta berperan dalam emosi dan kemampuan, dan hemisfer kiri yang mengatur motorik sisi kanan tubuh. Dua fase terakhir ini terjadi pada saat perubahan dari Homoerectus ke Homo Sapiens.

- Hubungan antara otak dan bahasa awalnya ditengarai dari adanya kerusakan pada otak yang mempengaruhi kemampuan berbahasa. Hal ini dikemukakan oleh Edwin Smith, ilmuwan Amerika, yang menemukan lembar papirus pada tahun 1862 yang menyebutkan adanya 48 kasus yang terjadi pada tahun 3000 SM. Kasus ke-22 menjelaskan tentang kerusakan otak akibat cidera kepala yang mengakibatkan hilangnya kemampuan berbicara.
- *Aphasia* adalah hilangnya kemampuan berbicara dan berbahasa akibat cedera otak. Contohnya Broca's aphasia yang berakibat pada kemunduran kemampuan baca tulis, keraguan berbicara dan bahkan pada beberapa kasus muncul gagap. Namun demikian kemampuan memahami bahasa tidak bermasalah. Adapun pada Wernicke's aphasia penderitanya akan mengalami kesulitan dalam mengolah masukan linguistik meskipun secara umum kemampuan baca tulis tidak terlalu terpengaruh. Penderita Wernicke's aphasia lebih fasih daripada penderita Broca's aphasia, namun demikian cara bicaranya cenderung bergumam dan tidak jelas ke mana arah pembicaraan yang dimaksudnya.
- Hubungan antara bahasa dan pikiran tampak dari adanya kemampuan dan ketidakmampuan berbahasa yang terkait dengan peranan otak baik hemisfer kiri maupun kanan yang mengelola masukan linguistik.[]

Text 2: CLASS NOTES

APHASIA

Aphasia is a condition characterized by either partial or total loss of the ability to communicate verbally or using written words. A person with aphasia may have trouble speaking, reading, writing, recognizing the names of things, or understanding what others say. Aphasia is caused by brain injury, as may occur during a traumatic accident or when the brain is deprived of oxygen during a stroke. It can also be caused by brain tumors, such as Alzheimer's disease, or infections, such as encephalitis. Aphasia may be temporary or permanent. Aphasia does not include speech difficulties caused by loss of muscle control (Llussa`, 2010).

A. Broca's Aphasia

Broca's aphasia, or called motor aphasia, results from damage to the front or frontal lobe area of the brain dominant language. Individuals with Broca's aphasia may actually not be able to use speech (mute) or may be able to use a single statement said or even full sentences, although these sentences may require a lot of effort to build. Small words, like conjunctions (and, or, but) and articles (the, a, a), can be eliminated, leading to "telegraph" quality in their speeches. Hearing comprehension is usually not affected, so that they are able to understand speech and conversation of others and can follow orders. Often, they may be experiencing weakness on the right side of their body, which can make it difficult to write. The ability to read is interrupted, and they may have trouble finding the right words when speaking. Individuals with Broca's aphasia may become frustrated and depressed because they realize their language difficulties. Several studies also show that in Broca'sApahasia the production of verbs is more impaired than the production of nouns (Bastiaanse & Zonneveld, 2003).

Initially, the cause of aphasia must be treated or stabilized. To regain language function, therapy should be initiated as soon as possible after the injury. Although there is no medical or surgical procedures currently available to treat this

condition, aphasia due to stroke or head injury can increase through the use of speech therapy. For most people, however, the main emphases are placed on making the most of retained language skills and learn to use other means of communication to compensate for the lost language skills.

Speech therapy tailored to meet individual needs, but the activities and tools that are commonly used are as follows (source: www.Aphasiapathway.com):

1. Training and Practice. Muscle weakness performed by repeatedly words certain words or makes facial expressions, such as smiling.
2. Picture cards. Pictures of everyday objects used to improve word recall and increase vocabulary. The names of objects can also repeatedly speak loud as part of routine training and practice.
3. Drawing board. Pictures of everyday objects and activities are placed together, and the individual dots to specific images to convey ideas and communicate with others.
4. Workbook. Reading and writing exercises are used to sharpen the word recall and re-reading and writing abilities. Heard understanding also restored using this exercise.
5. Computers. Computer software can be used to improve speech, reading, remembering, and listening comprehension, for example, display an image and have people find the right words.

Following Broca, Wernicke found Wernicke's aphasia which is characterised by syntactically complex and wellstructured speech, containing function words and correct affixation. Speech is apparently effortless, fluent and rapid. Indeed, many of Wernicke's patients claim not to recognise that they have speech difficulties. But there may be severe problems in retrieving vocabulary, with a reliance on general or inappropriate nouns and verbs. Comprehension may be markedly impaired (Field, 2004).

Early accounts of Broca's aphasia associated it with impaired motor activity which led to difficulty in assembling utterances; while Wernicke's aphasia was said

to reflect impaired access to stored lexical information. However, Broca's aphasics show signs not just of being unable to use functors appropriately but also of being unable to understand them.

The fact that the symptoms of aphasia vary considerably from patient to patient suggests that the language-sensitive areas of the brain may be differently located in different individuals. Alternatively, particular language functions may be so localised that a great deal depends upon the exact position of the lesion which inflicts the damage. Recent brain imaging data suggests a third possibility: the reason for the vulnerability of the Broca and Wernicke areas is that they constitute a major crossroads for the neural connections which transmit widely distributed linguistic information across the brain (Field, 2004).

Instead of relating type of aphasia to the area of the brain in which damage has occurred, clinicians prefer to analyse symptoms. A first observation might consider the extent to which lexical-semantic processing is impaired, as against grammatical or sentence processing. However, a distinction is still often made between non-fluent aphasia of the Broca type and fluent or expressive aphasia of the Wernicke type.

B. Writing Treatment for Aphasia: A Texting Approach

A study on the treatment for aphasic is published in journal of speech, language, hearing research of American Speech-Language-Hearing Association. It was done by Beeson et al in 2013. It is the latest research working on the treatment for people with Aphasia. It focuses on writing treatment for aphasia using texting approach from cell phone, because their consideration about the increasing role of electronic communication reliance. In which, individual with aphasia may have the need, or desire to communicate electronically. Further, people with limitation in spoken language may be assisted by the function of written communication that proves to be the primary modality for the successful exchange of information (Beeson, 1999; Clausen & Beeson, 2003; Robson, Marshall, Chiat, &Pring, 2001).

The study aims to understand whether the treatment using typing feature of cell phone can help people with aphasia to communicate or not. Applying the text

message for communicating is the clear goal of this research. Additionally, the study includes Mr. J, a person with aphasia, whose age is 31st, previous study's method that was CART (Copy and Recall Treatment), an Alltel LG cell phone with a slide out QWERTY keyboard as the particular element for the research.

The findings in that study shows that texting method is related to handwriting treatment that is known as CART. Typing, like handwriting, involvessemantically guided retrieval of appropriate words and theircorrect orthography. Spellings can be retrieved as lexical–orthographic representations or assembled with reliance onphonology (Hillis & Rapp, 2005; Rapcsak & Beeson, 2004;Rapp, 2002). However, the peripheral demands for keyboardand cell phone typing differ from those for handwriting,which requires specific letter shape (allographic) knowledgeand graphomotor movements to construct individual letters (Beeson et al, 2013).

Next, the treatment was conducted in 1 hour session weekly for 13 weeks. Mr.J learned how to memorize word using both handwriting and texting using cell phone. As the result, he could memorize 3 of 30 words by handwriting, while 0 of 30 words by typing. However, he continuously got the treatment using cell phone. The last result showed that spelling and spoken naming conducted for Mr. J gave a good result. The training resulted in functional use of texting that continued for two years after treatment. However, the study suggests a copy and recall methodology can be effective for trainingsingle-word spelling using the texting function on a cellphone in a similar manner that with pen and paper (Beeson et al, 2013).

C. Picture Naming pre and post rTMS to treat Aphasics

Based on the research by Naesar et al (2004), picture naming in pre and post repetitive Transcranial Magnetic Stimulation (rTMS) belongs to a treatment for aphasics.. rTMS can affect in language improvement, ranging from facilitating of naming to speech arrest.

In Naesar's research, there are four aphasia patients at 5-11 years post stroke. The first patient had recovered from nonfluentBroca's aphasia to anomic/conduction aphasia. The second and third patients have mild nonfluentBroca's aphasia, and the last patient had worst nonfluent, global aphasia. All of patients did not receive any individualized speech therapy during the study.

Picture naming itself are used for testing the result of rTMS in this study. rTMS spend about ten days. Within 1-2 weeks before the first rTMS treatment, aphasia patients had first naming test with the first 20 items of the Boston Naming Test (Kaplan, Goodglass and Weintraub, 2001). Then, at 2 months after rTMS, aphasia patients had naming test post rTMS treatment. Commonly, it used about 260 pictures from Snodgrass and Vanderwart (1980). But, in Naesar research,it was five naming list (100 pictures). Each list consists of 20 pictures.

All words in picture naming were only 1 -2 syllables, most of them was monosyllabic like buy, chick, and so on. Each list contain of different semantic categories such as animals, food, furniture and etc. (Naesar et al. 2004)

Picture naming for the patients was measured in two ways. First, is that total number of pictured named correctly. The second is that using sound edit software. The average is each patients at least can name three pictures per list across five lists.Thus, the result of the study of Naesar et al. (2004) is the picture naming pre and post rTMS were obtained. The aphasia patients had significant improvement.

However, Picture naming for aphasia is most likely the usual game for children, but it is different. Picture naming for aphasia provides techniques proven affective to help users recall items as well as develop to the skill to describe an idea when the name cannot be immediately retrieved (www.Tactustherapy.com).

References

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Text 3: ANOMIC AND GLOBAL APHASIA

1. ANOMIC APHASIA

Anomic aphasia, commonly known as nominal aphasia, is a disorder which causes problems with recognizing words or naming objects which the subject should know well (Cafuz, et al., 2013).

Anomic Aphasia Characteristics

The characteristic of Anomic aphasia is categorized by difficulties in recalling words or names of people, places, things and others. Patients suffering from aphasia usually speak indirectly to express certain words that they do not remember the name. In cases speech production is fluent but contains semantic paraphasias (usually with obvious similarity to the target word), sometimes they need some instructions to help them remember the names or words. They actually can speak with correct grammar; however, they have problems in finding the right words of people names or objects.

In certain cases, they basically know the function and the way to use the object, but they still cannot give the name and label for the object. For example, if a patient is shown an object like orange and asked what was called, they may be aware that the object edible. However, they do not remember that the object is called orange. They just remember that they have ever eaten it.

Because of those difficulties, he or she struggles to find the appropriate words for speaking, understanding, reading, and writing. In acute cases there can be long pauses during which patients search for words with great effort, these pauses are often filled with set phrases. Patients are often frustrated when they know they know the name, but cannot produce it.

Difficulties in word retrieval may manifest themselves by hesitations or a lack of response, or by one of the following errors:

• semantic paraphasias: errors in word-meaning; often words are selected that have semantic features in common with the target (e.g. apple instead of pear)

• phonological paraphasias: errors in word-form, i.e. in the selection and sequencing of word sounds (tear, or a non-existent word like kear, instead of pear)
• neologisms: unintelligible words (saggel)
• superordinates and generalisations: e.g. fruit or thing instead of pear
• circumlocutions, e.g. something you can eat, it grows on a tree
• recurring utterances: repetitive sounds words or phrases, e.g. du.du.du.; I'm a stone, I'm a stone. (Code in Doesborgh, S.J.C. ,2004).

There are three main types of anomic aphasia:

1. Word selection Anomia

It occurs when the patient knows how to use the object and selects the target objects correctly from several groups of objects yet cannot name the object. The patients can separate colors into categories, but they cannot name them.

2. Semantic Anomia

It is a disorder in which the meaning of words becomes lost. Unlike patients with word selection, patient with semantic anomia cannot select the object correctly from a group objects even provided with the name of target objects.

3. Disconnection Anomia

It is caused by the severing of connections between sensory and language cortices. Patient with disconnection anomia is limited to a specific modality. For example, when the patient is limited to a specific sensory modality, such as hearing, they may able for naming the object when it present through audition and may not be able to mention the same object when it presented visually. This case is the consequence of disconnecting between the visual cortex and language cortices. Patients with disconnection anomia may also exhibit callosal onomia, in which damage to the corpus callosum, prevents sensory information from being transmitted between the two hemispheres of the brain. For instance, if a patient with this type of disconnection anomia holds an object in their left hand, the sensory information about the object

would be sent to the right hemisphere of the brain, but then would be unable to reach the left hemisphere due to callosal damage, resulting in the inability to name the object in the left hand. In this example, the patient would have no problem with naming, if the test object were to be held in the right hand. This type of anomia may also arise as a consequence of a disconnect between sensory and language cortices.

Anomic Aphasia Causes

It is caused by an injury to various parts of the parietal lobe or the temporal lobe of the brain. The damage can be caused by trauma, stroke or tumors. The parietal lobe is responsible for integrating sensory information, while the temporal lobe is responsible for processing auditory information, as well as semantics in speech and vision. The main causes of anomic aphasia are not specifically known, although many researchers have found contributing factors to anomia. It is obvious that people with damage to the left hemisphere of the brain are more likely to have anomic aphasia. Aphasia is a language disorder caused by brain damage in the dominant hemisphere, i.e. the left hemisphere in all right-handed people and in about half of the left-handed. The most common cause (80%) is a stroke. (Doesborgh, S.J.C. ,2004).

2. GLOBAL APHASIA

Definition

Aphasia is a disorder that can result the impairment of language. It usually attacks left side of the brain. There are many kinds of aphasia, one of them is global aphasia. It is type of aphasia that is usually related with a large lesion in the left side of hemisphere in the perisylvian area. It involves a "left side blowout" which includes Broca's area, Wernicke's area and the Arcuate fasciculus. This is the most severe type of aphasia because an acquired language disorder involving severe impairments in both comprehension and production.

According to Lexander & Loverso (1992) “Global aphasia profoundly impairs all aspect of language, oral and written production as well as auditory and written

comprehension. The syndrome is usually due to a large lesion of the left perisylvian cortex."

Indah (2011) states that people who suffer global aphasia experiences complex difficulties due to damage to the entire left hemisphere. They are usually poor in speaking spontaneously and cannot listen and repeat the sentences. Another source also states that global aphasia is an extreme impairment or loss of language ability in all input and output modalities. It means that the individual who suffer of global aphasia has poor language comprehension as well as the inability to speak or write.

Characteristic

Ozeren et. al. (2006) states that a characteristic of this communicative disorder involves serious impairments in all aspects of speech and language. Such effects can result from lesions in the 'anterior-posterior' areas of the brain. People who suffer global aphasia have many characteristic that we can know from their language. There are several characteristics which are possessed by them, such as:

- People with global aphasia have a lot of trouble with speaking, writing, understanding and reading.
- Speech: either mute or effortful with repetitive vocalizations of single words/syllables.
- Reading and writing: writing is not possible, reading comprehension worse than listening comprehension.
- People with global aphasia have severe communication difficulties and may be extremely limited in their ability to speak or comprehend language.
- When trying to communicate something else, naming, repeating, and auditory comprehension are extremely impaired.

Obler & Gjlerlow (2000:40) have made a summary about aphasia in this table:

Aphasia	Language production	Understanding	Repeating word	Labeling	Brain injury
Broca	Not fluent	Good	Bad	Bad	Anterior
Wernicle	Fluent	Bad	Bad	Bad	Posterior
Global	Unable	Bad	Bad	Bad	Wide

Causes

Global aphasia is usually caused by injuries to language-processing areas of the brain, notably Wernicke's and Broca's areas. Many times, the cause of the brain injury is a stroke. It occurs when blood is unable to reach a part of the brain. Brain cells die when they do not receive their normal supply of blood, which carries oxygen and important nutrients. Other causes of brain injury are severe blows to the head, brain tumors, brain infections, and other conditions that affect the brain.

Symptoms of global aphasia

The symptoms of global aphasia effect processing difficulties in wernick's and broca's area (NHS, 2012). These are ordinarily assign word and meaning, string word together, and complete other word based task. Because of that reason, the symptoms of global aphasia are impairment in all aspect of word such as communication, reading, writing, speaking, and understanding aspect. Moreover, the exact symptom is different from individual to individual. For instance, some global aphasic person do not understand speech at all, while other recognize familiar personal names and are able to follow whole body commands. In addition, some individuals are mute while other can produce a few sounds (e.g. ta..ta..) or stereotypic phrase (e.g. we said).

According to NHS (2012), other symptoms of global aphasia can include paralysis of the right side of the body, some loss of vision, loss of voluntary control of their limbs, problems pronouncing certain sounds and words due to difficulties controlling the mouth, tongue and voice box.

Effect of global aphasia

There are many effects that can come to global aphasia patients. It can happen because the injury of their brain. One of the effects is *hemiplegia*. *Hemiplegia* is the condition that can make somebody only can paralyze on one side of their body. This condition also happened after someone got stroke. Other effect is facial apraxia. Facial apraxia makes somebody have difficulty in coordinating facial movements. In addition, the person with global aphasia will has unstable emotion. They cannot regulate their emotion. Furthermore, depression and feeling of sadness may result directly from their brain injuries. It can happen because they are not able to response and they loss their ability specifically in language. Other things of the effect from global aphasia is related with language ability like can produce word, cannot speak, write, etc.

Ways of communication with global aphasia sufferer

Ways of communication with the sufferer is an important thing if we talk about aphasia specifically global aphasia. If we do not know how to communicate with the sufferer, sometimes it can make them more in problem. There are many strategies that we can use in communicating with global aphasia sufferer. The first is tactile strategy. In tactile strategy, we can use touch to gain person's attention and to show our support. The second is visual strategy. In this strategy we use simple gesture and facial expressions. We also can take advantages of visual clues that have been learnt in therapy. The third is simplified – speech strategy. When we speak with global aphasia sufferer, we have to minimize distraction. We also have to speak slowly, using simple words, in a tone that is appropriate for response. We also can try to let the person speak for him or herself. The last is combination strategy. In this strategy, you can reinforce your speech with visual methods. For instance, you can couple in visual "hello" with the greeting and point to object as you talk about them. In addition, by reinforce our speech; we may be helping the person to make association that he or she will use in the future.

According to Towey and Pettit (n.d.), there are nine areas which involved in the treatment of global aphasia through a communication competence approach. Those are

a. Verbal behavior
    - Names: by using patient's name we can build a good relation with the patients which is very important in the treatment process. For knowing this, we should interview family and friends of the patient what are the preferred manner of addressing the person.
    - Verbal response: verbal responses are used to indicate understanding of, and feeling for, other person's situation, in attempting to respond to the effective needs of a patient.
    - Avoiding interruption: rhythm, intonation, and speaker behavior are all used to determine when a message is complete, to avoid the rejection and frustration associated with the interruption of a message that may be unintelligible. In addition, increased understanding on the part of the listener facilitates improved communication and interaction.
b. Non-verbal behaviors
    - Eye contact: waiting for and maintaining eye contact is seen as important in keeping the channels of communication. Lack of aye contact may signify excessive anxiety, poor self-image or rejection by the patient. A blank look may indicate depression or lack of understanding. Moreover, good eye contact is generally felt when the listener utilizes glances of three to ten seconds in length.
    - Head nods: observation of the presence or absence and rate of head nods can indicate participation, understanding, and desire to response within an interaction. Head nodding that is done slowly may indicate that the listener is relaxed and attending to the speaker, while increased speed of head nod may indicate that the listener is prepared to take a turn in the interaction or is becoming anxious or impatient.

- Facial expressions: facial expression is used to indicate support, empathy, and pleasantness. Facial expression may also convey concern, anxiety, fear, depression and support. In addition, facial expression can be used not only convey those feeling to patient but also to assist in understanding the patient's intent.
- Reciprocity of affect: smiling, laughing, frowning, scowling, and other cues are response to in reflection of the effect that is displayed by the patient.

c. Proximic Consideration

- Physical proximity: positioning can be used to indicate support, comfort, and contact with the patient. A patient's need for space must be respected based upon observation with different kinds of physical contact in space. By making and giving the best space with the patient, it can make help the patient.
- Postural cues: postural cues include rocking movements and leg and foot movement to indicate anxiety, comfort, participation, and attention. Observation of postural clues provides information about the quality of the interaction and opportunity to more appropriately respond to the needs of the individual.

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