LANGUAGE COMPETENCE OF STUDENT TOWARD RIGHT HEMISPHER BRAIN FUNCTION : A Neuropragmatic Study

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Abstract

It has been known that the right hemisphere is contributed to language processing, especially in macro level, including macrostructure or discourse processing. This research is aimed at evaluating the students' ability in language processing concerning macrostructure and the right hemispher brain function. This research is based on Dharmaperwira-prins method "Right Hemisphere Communication Assessment" (Pemeriksaan Komunikasi Hemisfer Kanan/PKHK). Research on students' ability in macrostructure processing is important to conduct since students nowadays are regarded lack of ability in well being communication. The research is conducted toward 38 students of English Department of Andalas University. The data are taken by paper test which is designed to evaluate the students' ability in macrostructure.

The result of research shows that most students have problems in providing important information, adjective, and feeling. By this result, it can be assumed that the participants have problem in right hemisphere competence concerning to language processing. These problems evoke not by accident or lesion in right hemisphere, yet it is caused by brain development which is focused on left hemisphere only.

Keyword: *Right Hemisphere, Language Assessment, Lexical Semantic, Macrostructure, Pragmatic*

I. Introduction

The term macrostructure was firstly used by Bierwisch (1965) which then being used by Kintsch and van Dijk (1978) to define the characteristic of text or discourse. They discussed about cohesion and coherence in text, as well as topic or main idea. Brown and Yule (1983) then developed the characteristic of text by mentioned more comprehensive aspects, including topic (sentencial topic and textual topic), theme, relevance, information structure (new information and ol information), complateness, cohesion and

coherence, and message or moral value of text.

In general, macrostructure can be used to evaluate various levels of language. It is possible because macrostructure provide two-way process, bottom-up and top-down. Bottom-up includes single information or proposition which related to semantic of text. In other hand, top-down includes inferential process which involves cognitive and linguistic aspect. This inferential process enables people to use macrostructure to 1) summarizing, 2) figure out the main idea, and 3) lesson or moral value of certain text (Ulatowska, et.al., 1999). Macrostructure is processed in right hemisphere, especially around anterior of gyrus cingulate, temporo-parieto-occipital, medial pre-frontal, and precuneus (Fonseca dkk, 2009).

Lately the study of macrostructure has been conducted by several clinician in order to describe communication skill toward patient with brain injury, such as from geerman neurolinguist Huber (1990) and neuropsychologist Glosser (1993), Malloy, Brownell and Gardner (1990) in United State; Joanette dan Goulet (1990) in Canada; and speech therapist Myers (1993), and Brookshire and Nicholas (1993). It is because macrostructure provides more comphrensive aspect which can be model for understanding and producing discourse or text, incuding problem solving, providing solution, or critical analysis. Hence, the problem in macrostructure aspect may provide bad impact in communication.

This research is aimed at observing right hemisphere competence in respect to perception of macrostructure in Englsih Department students of Andalas University. Therefore, the research requires quantitative approach to evaluate perception competence of macrostructure in form of statistic value and qualitative approach to provide brief description of students' competence.

The current research is conducted toward English Department students of Andalas University. The subjects are selected based on their knowladge in macrostructure and discourse analysis. The research then being conducted toward Pragmatic class year 2013/2014 which consist of 38 students.

The current research provides language battery and quistioner which have been developed based on language competence assessment in right hemisphere function. The initial part of the instrument consists of general information about participant, such as name, age, and sex. Then, the medical history is recorded in the next part, especially information about brain health.

The research instrument is also

equiped by language battery for diagnosing and classifies communication impairment which consists of two parts:

Observation: consist of evaluation of general aspect which affect communication and motoric.

Anamnesis: consist of recapitulation of communication impairment in certain patient.

Language battery is developed based on research objective, practicality in scoring, and ease of interpretation. For each aspect of competence is provided with objective and instruction for assessment. The language battery is also equipped with instruction for scoring and how to decide whether the participant has impairment in certain aspect or not. For advance scoring, the battery is also provided with qualitative scale (normal, impaired, and seriously impaired) and third scale (good, moderate, and bad).

The development of right hemisphere communication assessment was initiated by the idea of questioner which can be used as an instrument to evaluate right hemisphere dysfunction. Dhramaperwira-prins (2004) developed the method of right hemisphere communication assessment by enhancing the some initial methods, such as Right Hemisphere Language Battery. These methods ware being evaluated regarding to more complex variable and various types of task (Dharmaperwira-prins, 2004:99).

Right Hemisphere Communication Assessment (RHCA) consist of a battery and questioner. It also provides an instruction, a summary of right hemisphere dysfunction, and assasement report. The questioner is developed based on reliability, validity, and practicality (Dharmaperwira-prins, 2004:101).

The development of communication battery begins with diagnosis and identification of dysfunction concerning to lexico-semantic, macrostructure, pragmatic, prosodic, and writing. The dysfunctions then being put into a battery by considering the characteristics which has been mention earlier (Dharmaperwira-prins, 2004:102). The battery should be developed as effective as possible in order to achive the objective of assessment in short time (around 1 hour). Moreover, the battery should be easy to score and to interpret.

The current research employs this method because its practicality, comprehensiveness, and validity. The practicality of this method is reflected on the instrument of assessment which provides questioner, assessment list, and summary of dysfunction. The comprehensiveness of the method is

indicated by the aspects of competence which can be evaluated by using questioner of RHCA. This method is also has high level of validity since it had been applied to speech therapist, patient with right hemisphere brain injury, and normal people.

The data are collected by using observational method (Sudaryanto, 1993: 133-137) through right hemisphere communication battery and right hemisphere communication questioner. The questioner consists of 5 tasks with several questions which are designed to evaluate macrostructure competence. The analysis of data is based on referential and pragmatic identity method (Sudaryanto, 1993: 15). By this means, the key factor of the analysis is based on the fact that the language refer (referential identity method) and the hearer (pragmatic identity).

II. Discussion

Macrostructure's competence can be evaluated through retelling a story. It includes both perception and production competence. Perception's competence of macrostructure depends on the function of posterior areas and some other areas od the brain. Therefore, dysfunction in these posterior area may distract people in comprehend and produce a story (Dharmaperwira-Prins, 2004: 54). In interptating a story, right hemisphere will process input diachronically and then being synthesize to figure out whole story (Rehak et.al. in Dharmaperwira-Prins, 2004:55).

1. Understanding Theme of a Story

Competence in understanding theme is important in order to understand the whole story. The result of macrostructure competence test toward English Department students shows that there are 7 (18,42%) students have difficulties in understanding theme. These students provide answer with certain event in the story which may not represent a whole story. Moreover, around 7 (18,42%) have not answer the question which indicate neglecting and ignorance toward the task. This ignorance may indicate that the participants have problem in focusing and obeying instruction which related to posterior area of the brain.

The story tells about patient and tolerance which can be inferred from whole story. It tells about a man who gets angry with a little girl. He is angry because the girl takes a long time to count her money. The man reaction makes the girl afraid. Long story short, the man lost his wallet and the girl found it. She could take revenge to this man, but she decides to go to the man house and give his wallet back.

The impairment in understanding theme makes the patient hard to figure out the main idea of the story. Theme usually reflected in the title of the text or story. Van Dijk (1988:248) defined title as a unit of cohesion or semantic unit of a text or discourse, and also the most memorable information for the reader.

Dharmaperwira-Prins (2004:54) stated in interpreting a story, patient with right hemisphere dysfunction tends to focus on time or chronically sequent which is part of left hemisphere function. The patient is barely able to draw conclusion or general idea of a whole story. Hough (1990) also stated that patient with right hemisphere dysfunction barely understand delayed-theme rather than original-theme or initial-theme.

2. Memory

The current research shows that many students have problem in memorizing, especially direct-memory. Direct-memory is a memory which is set periodically based on the time it being stored, while delayed-memory is set non-periodically. Among 38 participants, 9 (23,68%) participants are categorized as moderate impaired, and 4 (10,5%) participants are considered as serious impaired in processing direct-memory. Direct-memory competence can be infered from the story that the participant re-write.

In rewriting a story, memory can be inferred from the unit of information that the participant provides in his/her writing. Educational factor plays important role in this aspect which may indicates different levels of impairment:

1. For participant with elementary school degree requires 10 correct units of information

2. For participant with high school degree requires 12 correct units of information.

3. For participant with higher education (university degree) requires 14 correct units of information.

By this standard, among 9 participants with direct-memory impairment, 4 of them are considered seriously impaired. It can be inferred from the unit of information they provide in re-writing the story which less than 10 units.

Regarding to information processing and analysis, prefrontal area plays an important role. Left hemisphere will be more active when the input is related to microstructure (such as lexical or clause), while right hemisphere will be more active when the input is related to visual information processing (such as story or text). Therefore, dysfunction in right

hemisphere brain may cause memory impairment. Memory is important aspect in human life which related to learning. Learning is a process of information gathering, while memorization is a process of storing information which can be expressed in certain time (Squire in Dharmaperwira-Prins, 2004: 18).

3. Understanding Important Information

Perception competence of understanding important information can be inferred from re-writing a story. The story is summarized into the following information:

1. *Seorang lelaki belanja dan kehilangan dompetnya* (a man go shoping and lost his wallet)

2. *Baru di kassa ia mengetahuinya dan ia pulang tanpa belanja.* (he relalizes when he want to pay in cashier and back home without any groceries)

3. *Seorang anak perempuan menemukan dompetnya dan mengantarnya ke rumahnya.*(a girl found his wallet and takes the wallet to the man house)

4. *Anak perempuan itu diberikan buku*. (the girl is given a book)

The information above are the main information which should be mention in the participant's rewriting which develop the whole story. The assessment toward English department students shows there are number of students who have difficulty in grabbing the information. About 23 (60,52%) participants cannot provide all required information in their writing while 3 (7,89%) participants cannot complete their story. Generally, the participants at least miss one information, especially information number 4. This information is closing part or resolution of the story. As van Dijk (1988) stated that the resolution in narrative structure provides consequent of entire story. By neglecting this information, the participant tends to ignore the unity of the story.

Bloom (in Dharmaperwira-Prins, 2004: 58) stated that people with grabbing information impairment tend to use same amount of words as complete story but with more vague and useless word. The impairment of this perception competence may cause the patient has problem in selecting the information to store in his/her memory. In procedural task, people with this impairment cannot execute the procedure correctly. Roman et.al. (in Dharmaperwira-prins, 2004:54) argued that people with right hemisphere function basically uses same amount of words or even more than the complete story. They may add their opinion, joke, or unrelated statement to the story.

Practically, this competence has an

important role in summarizing information or story. Van Dijk (1988:14-16) mentioned that narrative structure (story or text) consists of general information (title and topic), plot (sequent of events and background), and consequence (comment and summary). General information is usually provided in title and main idea/topic. According to van Dijk, this information is the most memorable information which will be recall when the people are asked to tell the story.

4. Understanding Emotional Word

Emotional word has an important role in leading the emotion and pace of a story. The result of test toward English department students shows that there 7 (18,42%) participants who cannot grab emotional state of a character in the story. When the participants are asked to mention the feeling of the man when the girl takes his wallet back, they give incorrect answer. Instead of providing the answer with *malu* (ashamed), they provide the answer with *senang* (happy). The answer of these 7 participants indicates that the participants ignore the sequent of events which leads the reader to understanding the man feeling or emotional state when his wallet is taking back, that is ashamed. The incompetence in figuring emotional word may distract communication, especially interpersonal communication, which evoke conflict in social communication.

Emotional word deals with psychological aspect of the story. The competence in figuring emotional word is very helpful in understanding the hearer intention in conversation or character in a story. Bloom (in Dharmaperwira-Prins, 2004:54) provided example of patient who unable to figure out emotional word, when he was asked to re-telling a story, he was neglected emotional state of the character, such as happy, sad, mad, etc. This incompetence is regarded as impairment since it may make people consider that the patient is less thoughtful.

5. Figuring Implicit Relation (Coherence)

Coherence is related to the unity of the idea in a text. The assessment toward students of English Department shows that the students who unable to figure out emotional state also unable to provide implicit relationship (coherence) of the story. 8 of 38 participants (21,05%) are unable to figure out the implicit relationship in which 7 of them are those who are unable to figure out emotional word. This result shows that the participants tend to figure the information explicitly. They are unable to process whole information as a unit of idea of holistic processing. The ability to process holistic information deals with the

right hemisphere brain function.

Coherence deals with logical relation which can be drawn from sequent of narrative of story. Among the logical aspect of the story are implicit information and the consequent of information. People with right hemisphere dysfunction are unable to process logical relation when it being implied (Beeman in Dharmaperwira-Prins, 2004: 56). They tend to process information as a single idea which has no relation to other idea. The distraction in figuring implicit relationship may affect the interpersonal communication. People with lack ability of this competence may be considered as a plain, dull, or ignorant. This is because they fail to connect information one another in correct manner. In other word, coherence deals with ability to holistic or global processing which relates whole information in a text (Albrecht & O'Brien, 1993; Lehman & Schraw, 2002).

6. Figuring Emotional State

Language competence assessment toward English Department students shows great number of incompetency in figuring emotional state. 27 (71,02%) participants are fail in figuring emotional state which 5 (13,57%) of them are with serious impaired. In real life communication, this result indicates that students are unable to figure out the emotion of their hearer which may consider them as thoughtless.

The ability to figure out emotional state can be evaluated by the emotional word. It can be seen in re-writing a story. As the story given to the participant of assessment, the unit of information number 11, 12, 14, 26, and 27 provide feeling or emotional state. This information is about 17% of whole information (30 units of information). To evaluate this competence, the number of information that the participant provided is being compared with the total number of information. The result will be in percentage. If it is less than 15%, then the participantnts is considered as impaired. Serious impaired is reflected by the result which is less than 10% of emotional information.

Furthermore, in the level of word, people with right hemisphere dysfunction are also difficult in identifying emotional state through language (Borod, et.al. in Dharmaperwira-prins, 2004: 57). They also difficult to identify emotional in short sentence. For instance, the expression "I am so ...." , they cannot figure out whether it sad, mad, or .... In real life, the emotional state of people can be inferred from their face expression, body language, and voice intonation. Yet, linguistic aspect, especially written expression, is also can be a basis of emotional interpretation. It is

possible if the emotional written expression is relegated to the context of the story. The ability to interpreted emotional state in a story deals with the right hemisphere function which relates whole information in the story and then interprets it as a fact or an idea.

7. Figuring Adjective

Assessment toward English Department students also indicates impairment in figuring adverb. Among 38 participant, only 8 participants are aware of adjective while the rest (30 participant of 78,94%) are ignore it. The participants tend to neglect the adjective and only keep the noun. Adjective is regarded to detail information or description of a noun. In the task, the adjective can be found the phrase *perempuan kecil* (little girl) in unit of information 9 and *buku bagus* (good book) in unit of information 30. These both adjectives take 7% of the entire story. The impairment is indicated by the percentage of competence less than 5%.

The ability to figure out the adjective is important in communication since it provides detail information of an object of noun. In real life, this impairment may not subtle, but it affects communication. People with this impairment are considered as careless and reckless. This impairment is caused by the attention deficit which make people tend to ignore, delete, or generalize the detail information.

Chomsky (1957) defined that based on model of thought, people store information in three ways, deletion, distortion, and generalization. These processes deal with right hemisphere function to decide whether the information is important or not. People with right hemisphere dysfunction will consider the adjective as unimportant information or unaware of the adjective.

The competencies above are related to linguistic perception of ability to integrate the entire parts of a story in order to be logic based on macrostructure aspect. Moreover, the ability to gain and figure out all important information is also related to memory and attention. Over all, the result of language assessment toward English Department students is mention in the table below:

Perception Competence of Macrostructure toward
English Department Students of UNAND

No	Competence	Level of Impairment	
		Impaired	Savere
1	Understanding Theme	(18,42%)	(18,42%)
2	Direct-memory	(23,68%)	(10,5%)
3	Delay-memory	-	-
4	Grabbing All Important Information	(60,52%)	(7,89%)
6	Grabbing Emotional Word	(18,42%)	-
7	Figuring Implicit Relation (Coherence)	(21,05%)	-
8	Figuring Emotional State	(71,02%)	(13,57%)
9	Figuring Adjective	(78,94%)	(7,89%)

The table above shows s that the students of English Department have various impairments related to right hemisphere function. The impairment may affect students' ability in communication, especially in macro level. The result shows that several competencies are impaired in high number of participants, including grabbing important information, figuring emotional state, and figuring adjective. It also can be inferred from the result of analysis toward students' assessment in macrostructure competence that the students' nowadays have problem in social communication. The problems such as reckless, thoughtless, inconsiderate, arrogant, illogical thought, neglecting, and impolite, can be effects of right hemisphere dysfunction.

The impairment can be caused either by brain injury such as lesion or clot or brain development which focuses only on left hemisphere function. Regarding to brain development, brain functions whether left or right hemisphere are depend on stimulus or expose. The more it exposes, the more it develops. In real life, brain development is related to educational system, especially formal education. Since the educational system in Indonesia focuses on intelligence then it only exposes left hemisphere. Yet, the right hemisphere which deals with emotional, sense, logical thought is tend to be neglected.

III. SUMMARY

The analysis toward students' competence in perception of macrostructure shows that there are problem in several competencies, including understanding theme, memorization, grabbing important information, grabbing emotional word, figuring implicit relation, figuring emotional state, and figuring adjective. These problems can be problems in communication especially in performing well communication and can be consider as impairment. Since language is computerized in the brain, it can be inferred that these problems are related to brain function, in this context is right hemisphere function. Beside brain injury, brain impairment can be caused by brain development which regarding to brain exposing. Brain development is closely related to education which exposes brain function. The dysfunction of right hemisphere can be caused by the educational system which only focuses on intellectual competence in left hemisphere.

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