A Study on the Organization of First and Second Language Vocabulary Storage in Long-Term Memory through Semantic Network Structure

CHAPTER I

INTRODUCTION

1.1. Background of the Study

Just imagine when we are asked to determine today's date but we forget since we rarely see the calendar year. So, how do we go about finding the answer? Chances are we search for some identifiable information that is related to and near today's date and work backward or forward to today's date. It is likely that today's date is somehow related to and organized with other days' dates or other information. Perhaps holiday's date, birthday's date or other anniversary's date that is near today's date. Otherwise, we may also try to remember what happened, what we did the date before or what we are going to do the next date. Hence, we can locate the dates on which those memorable days or events fell. The information we settle on then provide a cue for finding the answer. For example, the stimulus information is Thursday that was holiday. It was the 13th of March. My mother was going to Bali for vacation. No one paid for the phone bill. So the next day would be Friday, the 14th of March, I went to the Bank to pay the phone bill. Saturday would be the 15th of March. My mother was home. Sunday was the

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16th of March. We went to visit relative in Malang. Today is Monday. So today is the 17th of March.

On the other hand, imagine how we might answer the question if our memory was not systematically organized. We might randomly recall information from our Long-Term Memory (LTM). Of course, there will be a silly lot of information, but it is equally silly to imagine an unorganized LTM.

Fortunately, the information in semantic long-term memory tends to be stored in an organized fashion as agreed by many psychologists as cited by Gerow in *Psychology–An Introduction*, in 1992. Perhaps the most pervasive assumption is that information in it is organized in some orderly way.

One example to validate this assumption is taken from the work of Paul Meara (1992). People are asked to respond to a stimulus word given with the first words that come to mind. The information retrieval from the stimulus to the target word occurs through word association network, as described below:
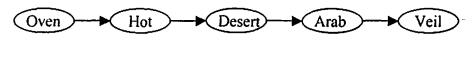

Figure I.1.

Such network exemplifies how people organize information in an orderly way through associations, by connecting one word to another word, presumably reflecting the closeness of the two words in semantic memory. The retrieval process is presented in terms of a network. To *oven*, they may well respond *hot*, *desert*, *Arab*, and *veil*. '*Hot*' may come first to mind since hot is the character of

'*oven*'. Another concept '*desert*' appears because the concept '*hot*' is associated with the characteristic of the concept '*desert*'. On the other hand, the concept '*desert*' is associated with the concept '*Arab*'. The last concept occurs since '*Arab*' is considered identical with the concept '*veil*'. Such associations tell something about what people know about certain object, its concept and word.

The justification for a universal theory of language acquisition is the fact that the capacity of human beings for learning new language is not limited to one language, the mother tongue (L1). People can indeed learn more than one language that is second or additional languages (L2, L3, L4). What people do seem to pick up in the new language are words or vocabulary. Vocabulary mastery is one of the global language competences as Savielle (1976) stated that vocabulary is one of the most significant aspects of language development. If there were no sufficient knowledge of mastering vocabulary, one would not be able to express his ideas easily or communicate with other fluently.

Learning new words continues throughout a person's lifetime, especially in societies where there are always new objects being invented, new ideas requiring new labels, even new words for old things. This is not surprising if one considers the amount of time of bilingual or multilingual learning languages that L1 learner has more time to enrich his vocabulary storage than L2 or L3 learner. It is plausible because L1 learner acquiring his language since he was a child while L2 or L3 learner acquiring his new language after he acquiring his mother tongue or L1 in which his language competence has been so complicated and may have the interference of L1. Here, we assume that the vocabulary storage of L1 is

bigger than L2 in LTM. Thus, in the retrieval process of stimulus–target words in LTM, L1 vocabulary item has higher valency or accessibility to combine with another or others than L2 vocabulary item.

The fanciful organization of vocabulary storage in LTM has interested many experimenters to use many different techniques to study it and test hypotheses on it. One of the techniques is by using Network Model that is proposed by Collins and Quillian in 1986 (in Gerow, 1992). In network model, concepts exist in memory as independent units connected in a network. The storage of words is tied to a complex network of relationships.

Further and more interesting study is one, which was done by Paul Meara (1992). He tried to apply Milgram's Graph Theory (1992) to the network to study the mathematics of the graph or the network. In this study, he compared English (L1) network and Spanish (L2) network. However, the result was different from the previous assumption. The mathematics of the graph forced him to conclude that the valency in an L2 is higher than in an L1.

Being inspired by the phenomenon the writer has found out and referring to the related studies that were already conducted in the past, the writer is interested in doing a study on the organization of first and second language vocabulary storage in LTM through semantic network structure. But in this case, the writer uses different context. The object of this study is Indonesian as the first or dominant language (L1) and English as the second or foreign language (L2).

I.2. Statement of the Problems

Concerning the phenomenon, which the writer has found out that semantic network structure reveals the organization of first and second language vocabulary storage in long-term memory, the writer would like to state the problems as follows:

1. How concepts are associated to each other in either first or second language semantic network structure?

2. Is the valency of L2 vocabulary items is bigger than that of L1 vocabulary items?

   H_0 = the valency of L2 vocabulary items is the same as L1.

   H_1 = the valency of L2 vocabulary items is bigger than that of L1.

I.3. Objectives of the Study

Based on the statement of the problems above, this study is intended:

1. To find out how concepts are associated to each other in either first or second language semantic network structure.

2. To test the hypothesis on the vocabulary storage of L1 and L2 in LTM.

I.4. Significance of the Study

It is expected that the result of this study will be useful for students of Linguistics, Psycholinguistics, and Psychology since this study has been proposed on the boundaries of these fields. In Pure Linguistics, it may increase students' knowledge about semantic analysis while in Applied Linguistics, this study may

give useful contribution to the teaching field. It also provides reference for Psycholinguistics students who do studies on the relationships among vocabulary acquisition, human's memory and semantics, since there is limited information dealing with such study. For Psychology students, the data presented and the results of this study may give a lot of contributions to exploring more about the organization process of information in human's memory.

I.5. Theoretical Framework

In doing this study, the writer uses Psycholinguistics approach, which demands an extensive explanatory understanding not only in the linguistics field itself but also on the overall idea of the topic chosen dealing with Psychology. Hence, the writer needs to apply some theories on both Psychology and Linguistics.

The Psychology theories are important in exploring the issues regarding how information is stored and organized in memory. These theories cover theories on memory and long–term memory. On the other hand, the Linguistics theories deal with Semantics theories of the meaning of word and Palmer's theory of sense or paradigmatic relation. The Semantics theories are used mainly by the writer to analyze the data of this study.

Furthermore, the writer uses semantic network structure theory, which is the parallel of Psychology–Semantic theory. This theory has a not less important role in this study as it can be used to reveal the vocabulary storage of L1 and L2 in

LTM. In addition, the writer also reviews some related studies that had already done by experimenters in the past.

The application of the theories above helps the writer to clarify the topic chosen and to gain the objectives of the study.

I.6. Scope and Limitation

The result of this study opens to broadening possible questions that need to be considered and discussed. Therefore, the writer limited this study to reach the goal of doing this study.

The writer only appeared nominal in the model test paper and ignored aspect such as the duration of the items stored in the respondents' LTM. The writer had considered that the stimulus and target words used are basic or frequent ones.

The writer also considered the data or the Indonesian-English semantic network structures as two distinct data. Thus, they are independent to each other while any possible similar responses found in either the Indonesian or the English semantic network structures are assumed as not to be the previous translation equivalent but as part of the later vocabulary storage.

Since the data of this study are too many, the writer limited the qualitative data to the data of 3 respondents, which were chosen randomly from the 30 respondents of the quantitative data.

In this study, the writer tried to describe and analyze the association chains in the semantic network structures based on the interpretation of the respondents

with made no attempt to check the validity of the associations and even to study further the outcome of the hypothesis test.

I.7. Method of the Study

In this study the writer combined two research methods: *Qualitative-Quantitative*. According to Dabbs in 1982 (cited in Berg, 1989), *qualitative* refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things while *quantitative* refers to counts and measures of things.

Here, the writer used the qualitative method to describe the qualitative data of this study, that is, to describe concepts and analyze the relationships among the concepts in the semantic network structures produced by L1 and L2 speakers. On the other hand, the quantitative method is used since the writer attempted to test the hypothesis proposed.

I.7.1. Definition of Key Terms

In analyzing the relationships among concepts in the semantic network structures and the parallel to vocabulary storage of L1 and L2 in LTM, there are some terms used to clarify their meanings and context as follows:

- Long-Term Memory: A memory system for the retention of large amounts of information over long periods of time.

- Vocabulary Storage: The total number of words kept in memory for used as needed.

- Semantic Network Structure: A network of nodes representing concepts and links connecting the nodes, which organizes semantic information in LTM.

- Concept: Ideas that people have of objects, and consists of an intention (meaning) that specifies properties an object must have to be a members of the class and an extension that refers to the object having those properties.

- First Language (L1): The native, dominant, or home language.

- Second Language (L2): The nonnative language.

- Nominal: Words, which are used to name objects.

- Valency: The accessibility of a word to combine with another or others.

I.7.2. Location and Population

I.7.2.1. Location

This study took place in the English Department of Faculty of Letters of Airlangga University in Surabaya, where the students speak Indonesian as the dominant or first language (L1) and learn or speak English as the second or foreign language (L2). English Department requires its students to speak English especially in classes with subjects conducted in English. Therefore, diglossia exists in this environment in which the students speak both Indonesian and English in different functions. As defined by Fishman in 1967 (in Fasold, 1984), diglossia is where two varieties of two different languages exist side by side

throughout the community with each having a definite role to play. Such phenomenon implies the occurrence of code switching.

I.7.2.2. Population

The population of this study is the English Department's students of Letters Faculty of Airlangga University. In this study, the writer used purposive sampling to choose the respondents. The writer chose 30 students for the respondents of the quantitative data, while for the qualitative data, the writer only took 3 of the 30 respondents' data. The qualifications of the respondents are:

1. Students who speak Indonesian as the dominant or first language and English as the second or foreign language. Both languages are the objects of this study.

2. Students at the late semesters (7th to 10th semester students), since L2 vocabulary storage of students at these semesters is considered more complex than those who are at the earlier semesters.

3. Students with the minimum GPA of 2.75 as the intelligence standard.

I.7.3. Technique of Data Collection

Two tasks were given in doing this study. Both were carried out in writing. The enclosed model test papers are the written tests the writer used in the tasks. The model test papers are in two versions: the Indonesian and the English version. There are eighteen pairs of words in each version. Each pair consists of a stimulus and a target word. The stimulus words appear on the left side of the model test

papers while the target words on the right side. All the words were chosen randomly from "basic or most frequent vocabulary" in both languages and considered as nominal. The English version used the translation equivalent of the Indonesian words in English.

In the process of collecting the data from the respondents, the writer used Direct (Explicit) Approach. The first task was conducted by giving first version of model test paper that is the Indonesian version to the chosen respondents and asked them to construct a chain of associations for each pair of stimulus-target words using Indonesian words. Two weeks later, the writer conducted the second task by giving the second version of model test paper that is the English version to the respondents and asked them to construct a chain of associations for each pair of stimulus-target words using English words. The time limit imposed for constructing a chain of associations was one minute. So, each task lasted for about eighteen minutes. Dictionary-assistance was forbidden in doing the task. Briefly, the steps of data collection were set up as follows:

1. Giving the tasks: The Indonesian and the English versions of the tasks.

2. Asking the respondents to construct a chain of associations for each pair of stimulus-target word in either Indonesian or English version of model test paper.

I.7.4. Technique of Data Analysis

The findings of the data collection fall into two versions of data: the Indonesian and the English version data. The data are eighteen association chains

produced by each respondent in each of the model test paper. The analysis of both versions of data was done separately. But, the technique used for analyzing both versions of data was the same. In the first place, the writer constructed the eighteen association chains into a semantic network structure. So, each respondent contributed two versions of semantic network structure: the Indonesian and the English version semantic network structures. In the second place, the writer described the associations by analyzing the meaning of the associated words based on sense-components or features and connected it to the respondents' interpretation of the meaning of the association. In the third place, the writer classified the associations based on Reed's theory of Paradigmatic or Sense Relations. In doing this, the writer did not close the possibility to recheck the interpretation of the meaning of the associations to the respondents to have the same interpretation of the associations. Finally, the writer tested the hypothesis suggested in this study by using Paired T-Test (T-Test) of Bhattacharyya and Johnson (1977) which is useful to compare two different groups of data of two treatments and in Statistics, this test belongs to Parametric. To sum up, the procedures of the data analysis are:

1. Constructing the association chains into semantic network structures.

2. Describing the associations by analyzing the meaning of the associated concepts based on the sense components or the features and the respondents' interpretation of the associations.

3. Classifying the associations based on Reed's theory of kinds of relations among concepts in a semantic network structure and Palmer's theory of Paradigmatic or Sense Relations.

4. Testing the suggested hypothesis using Paired T-Test (T-Test).

I.8. Organization of the Paper

The writer presents this study into five chapters. Each chapter is described as follows:

The first chapter is an introduction. It is divided into eight subchapters: background of the study, statement of the problems, objectives of the study, significant of the study, theoretical framework, scope and limitation, method of the study and the organization of the paper itself. The second chapter is literature review. The writer reviews more detail the theories used in this study include theory on memory, long-term memory, semantic network structure, and semantic theory. The writer also reviews the related studies in this chapter. The third chapter is presentation of the data. Here, the writer presents the findings of the data collection, that is the constructions of the association chains into configurations of semantic network structures. The fourth chapter is analysis and interpretation of the data. It is divided into two subchapters: analysis of the data and interpretation of the data. The last or fifth chapter is conclusion and suggestion. The writer concludes the result of this study in this chapter.

CHAPTER II

LITERATURE REVIEW