The Process of Semantics Radicals (*Bushu*) during the Recognition Meaning of Japanese *Kanji* Characters

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Abstract: This study investigated the contribution of semantics radical approach during the recognition of *kanji*'s meaning. A number of studies have contributed in understanding Japanese characters learning strategies in the past decade especially the recent trend of e-learning and m-learning approach. However, learners with non-*kanji* backgrounds still find it difficult to understand the Japanese characters or known as *kanji*. Several studies have been conducted to examine systematically the role of radicals in Japanese reading development. To fill this gap, this study aims to find out the process and structure of *kanji*, and also to understand the meaning of *kanji* and their implications for *kanji* learning strategies for learners with the alphabetic-based background. The research method used in this study was a quasi experimental design which involved 25 participants. The results concluded that the radical (*bushu*) is an important orthographic processing unit in *kanji*'s meaning comprehension. A conceptual framework for further research is discussed in order to assist approaches in considering how to read in *kanji* learning strategies with semantics and phonetics radicals for alphabetic-based background learners.

1 INTRODUCTION

Japanese characters consist of logographic characters (*kanji*), syllabic letters (*kana: hiragana and katakana*), Roman alphabet (*romaji*), as well as Arabic numerals (Taylor and Taylor, 2014). The most complex Japanese letters are *kanji*. *Kanji* is visually complex, ranging in stroke numbers between 1 and 23 among the 1,945 of common *kanji* (Taylor and Taylor, 2014). Given a large number of *kanji* that cause difficulties for native Japanese speakers, it is not a surprise that mastering *kanji* is a complicated and frightening task for learners with an alphabetic-based language background (non-*kanji* background) (Rasiban, 2017).

Kanji learning is very complex for those who learn without *kanji* characters, because in addition to memorize the *kun-yomi* and *on-yomi* of the kanji, it is necessary to understand the meaning of the word and the way of writing it. As Toyoda (1995) argues through his survey, that middle-level learners find out that comprehending *kanji* is the hardest learning process because the lexical load increases. Responders' difficulties include retention, multiple readings from one character (such as Chinese), as well as visual similarity and complexity.

Radicals are defined as the smallest and most meaningful orthographic unit that plays a semantic or phonetic role in compound characters (Shen and Ke, 2007). In other words, radicals are repetitive structural patterns that convey semantic and phonetic information (Ho et al., 2003; Jackson et al., 2003). Semantic radicals give clues to the semantic categories of compound characters (decomposed characters being radical, for example, 洋, / yáng /, which consists of 氵 and 羊), while phonetic radicals give clues to the pronunciation of compound characters, although the overall meaning of semantic characters and radicals, and the overall pronunciation of characters and phonetics do not always match. Considering the amount, there are about 200 semantic radicals and 800 to 1,100 phonetic radicals exist. (Hoosain, 1991; Shu and Anderson, 1999).

Characters consisting of radicals are called compound characters (Shu and Anderson, 1999) and more than 80% of modern Chinese characters are

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compound sentences (Shu and Anderson, 1999). Thus, the introduction of semantic radicals is important in recognizing the meaning of Japanese *kanji* as well as in Chinese *kanji*. However, the study of radical semantics is limited in general, especially to Indonesian students. This study focuses on the introduction of the meaning of *kanji* for Indonesian students.

In the present study, we use the term semantic radicals to refer to "the understanding meaning of the role of radicals in forming Japanese *Kanji* characters". Radicals have two major features: (a) radicals usually have habitual positions within characters, and (b) they function to encode semantic information or phonetic information of characters. Experimental evidence for semantic radical's activation comes from single-character decision (Feldman and Siok, 1999), single-character decision with priming (Feldman and Siok, 1999) on Chinese, speeded single-character semantic-categorization (Flores d'Arcais and Saito, 1993) on Japanese, and single-character word naming on Japanese (Flores d'Arcais et al., 1995; Miwa, 2012). Previous research has shown that characters with a semantic radical occurring in many other characters are read faster.

Miwa's study (2012) seeks to clarify whether the effects of semantic radicals depend on their position in the left (modifier) versus the right (head) character (Miwa, 2012), and this present study also aims to clarify the role of the semantic transparency of semantic radicals, and to establish the extent to which radical type frequency effects to understanding *kanji*'s meaning for Indonesian Japanese as Foreign Language students with non-*kanji* background students.

This research will focus on the smallest part of radicals called semantic radical that function as symbol or encoding semantic information. This study examines how the semantic radicals process can contribute to recognize Japanese *kanji* meaning especially for students with non-*kanji* or alphabetical backgrounds.

2 METHODS

2.1 Participants

The participants who formed the focus of the study were selected from 25 students. Respondents in this study were taken purposively at the Japanese language education department.

Respondents came from students who took the subject of *Chuukyuu Hyouki* (Intermediate Japanese Writing) in a total of 25 respondents; 15 females and 10 males. Respondents were set in a group with intermediate level competencies in Japanese language with a range of 19 to 21 years old. In this study, the suggested intermediate level is a student who has studied Japanese language for 4 semesters or 2 years.

2.2 Instrumentation

In this study, the data were collected using the following instruments:

The Semantics Radical Task: This task measured respondent's explicit knowledge of the function of semantics radicals that provided semantics cues for each *kanji*'s character, and 'component analysis' task that contains about radical (*bushu*) component by breaks each *kanji* down into component parts of one to 10 strokes, then assigns a name to each/every radical (*bushu*) and every component, and then write down the meaning of radicals' characters.

The Semantics Radical Task has been given at the beginning, before experiment and after the learning activities provided with semantics radical and phonetics radical approach.

Questionnaire: This instrument is used to collect information in the learning process of *Chuukyuu Hyouki*, the semantics radicals approach, the contribution of semantics radical approach to recognize *kanji*'s meaning comprehension.

Deep Interview: This stage is conducted after the information collected through a questionnaire that is distributed. To deepen the information, an in-depth interview is conducted. The information collected including on what is the influence of semantics radical approach on the ability to remember meaning.

2.3 Procedure

The method used in this study is a quasi-experimental method. The treatment took 4 sessions and the procedure of the sessions as follows:

2.3.1 Session 1

In the first session, the students were given the pre-test (The Semantics Radical Task). After taking the test, students are given an explanation of the radical semantics of the *kanji* and introduces the *kanji* through radical (*bushu*). Each session is given 10 *kanji* characters.

2.3.2 Session 2, 3, and 4

The procedure of these sessions is the same for each session, like session 1. The final of the experimental

activity is the post-test and questionnaire. Afterwards, the total *kanji* studied in this study is 40 *kanji* characters in the book *Chuukyuu Hyouki*. This *kanji* are *kanji* of N3-N4 level in *Japanese Language Profiency Test* (hereafter is called JLPT).

3 RESULTS AND DISCUSSION

The results are obtained from the test scores at the beginning and after the experiment, questionnaires, and interviews on respondents. It is obtained from the experimental activity that has been done four times; the beginning with pre-test activities and ending post-test activities. This pre-test activity is aimed to collect preliminary information about students' ability in writing *kanji* and *kanji* teaching that has been done so far.

The average pre-test score was 63. There are several findings collected from questionnaire and interview information, then analyzed by looking back from the test scores obtained from each respondent. The findings are (1) almost all respondents feel confused in determining part of each component of *kanji*, so they cannot write radical / *bushu* from complex *kanji* letter; (2) almost 65% of difficulties are found in writing *kanji* and the complex way of reading; (3) almost 60% of respondents cannot write the meaning of *kanji* he or she wrote.

From the findings conducted at the beginning of the activity before the experiment, it can be concluded that the students still do not understand the component parts of each *kanji* letter, and lack in comprehending radical / *bushu* of *kanji*.

Based on the results of interviews and questionnaires that have been collected, the reason is because the respondents did not study and did not pay much attention to radical / *bushu* when learning *kanji*.

Based on this, experimental activities were carried out using radical approach to learning *kanji* four times. After the experimental activity, the post-test activities are conducted to measure and compare the results of respondents' learning ability to write *kanji*. The average post-test score is 95. It can be concluded that there is a significant increase in learning outcomes. When comparing the grade point average, the increase in learning outcomes has increased by 32 points. These results are reinforced by questionnaires and interviews show that the improvement of learning outcomes of *kanji* is influenced by radical approach learning strategy. In addition to the average grade increased with this strategy of learning radical approach, the ability of each respondent is also increased.

The following is the line graph that compares the pre-test score and the post-test score after the experimental in Figure 1 the graph shows that overall the learning outcomes of each respondent increase sharply. This is shown by the red line in Figure 1. There are only 12% of the respondents whose value is still below 70, this can be seen in Figure 1.

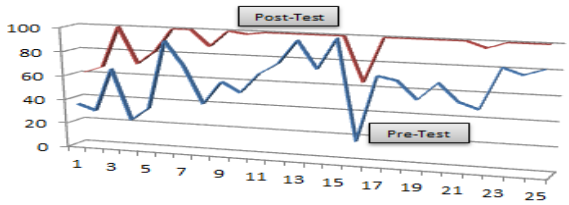

Figure 1: The Pre-Test and Post-Test Score Comparison.

From the three respondents who have post-test score below 70, their score increased but cannot reach the average score 70. This is because the three respondents did not make the preparation of learning and not memorize the subject matter.

Most *kanji* are semantic-phonetic composites. Semantic radical specifies semantic categories to which *kanji* belong and tend to form left components, while phonetics, which hint at the sounds of *kanji*, tend to form to right components. Radicals vary how closely they relate to composite *kanji* of which they form parts (Klingborg, 2012). This optimization of storage and computation should also be applied in reading Japanese and Chinese, languages with a morpho-graphic writing system. In these languages, a large majority of words is represented orthographically by means of two complex characters (Miwa, 2012).

The duration of time required for native Japanese speakers to learn *kanji* will raise questions on Japanese as Foreign Language (hereafter is called JFL) learners especially non-*kanji* background learners about how *kanji* should be taught. Learning *kanji* in the Japanese way takes a long time and requires considerable motivation from JFL learners who are limited in exposing their *kanji* in everyday life (Simon and Chavalin, 2014).

In conclusion, our findings show that the semantics radicals contribute to beginning foreign *kanji* learners from non-*kanji* backgrounds. On the basis of these findings, we suggest that semantics radicals approach is an important orthographic processing unit in reading development in Japanese characters, and their positional and functional regularities should be taught explicitly in class to enhance student's character decoding skills. The findings of the present study have implications for Indonesian JFL students from non-*kanji* background,

teachers and textbook writers in the Japanese language education in general. It is hoped that this study will trigger more research investigating the impact of pedagogical.

4 CONCLUSIONS

Semantic radicals were the only significant unique predictor of meaning recognition in Japanese *Kanji* characters after accounting for the effects of semantic radical and language proficiency. Productive semantic radical knowledge requires one to know the meaning and meaning-cueing function of semantic radicals, to retrieve correct radicals, and to apply this knowledge in character writing. Therefore, this study can be extended to further research by searching for remembering *kanji*' mnemonic image associations as a way to facilitate remembering the meaning of *kanji* and extended phonetics radical's approach to analyzing the phonetically homophonized *kanji* material from 'component analysis' *kanji* in compatible with the Indonesian JFL students from alphabetic backgrounds.

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