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EFFECTS OF INVOLVEMENT LOAD IN EXTENSIVE READING ON LEXICAL RELATIONS AMONG ALREADY KNOWN L2 WORDS

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Abstract

The effects of task-induced involvement load, *evaluation* and *need* in particular, in extensive reading on a change of the lexical relations that EFL learners perceive were investigated. Fifty-two Japanese university students were assigned to one of three groups. All groups were given the same reading material (an English passage of 319 words including 12 target words) but with different tasks. MCQ group answered multiple-choice questions about the contents of the passage. MCQ+FB group answered fill-in-the-blank questions in the passage as well as the MCQ. MCQ+Com group did a composition task using the target words as well as the MCQ. In addition, all participants judged the degree of relationship between target words three times, a week before the task, immediately after the task, and a month after the task. The mean of relationship score was calculated for each participant each time, and was used as a dependent variable that indicates the degree of deepening of the lexical network. Participants also answered questions asking about their intrinsic motivation for the task. The results showed, contrary to our hypothesis, that *evaluation* manipulated by the tasks nor *need* compared by the degree of participant's intrinsic motivation did not affect the dependent variable. Next, we analyzed the data by using AMISESCAL (Asymmetric von Mises Scaling), a statistical model that visualizes asymmetric relations among elements on a two-dimensional map, and found that the relations among target words largely depend on the main target word (keyword of the passage). Although the present findings were generally negative in terms of the Involvement Load Hypothesis (Laufer & Hulstijn, 2001), it was suggested that carefully choosing appropriate reading material with target words is important for the future studies.

Keywords: *Already known words, extensive reading, involvement load hypothesis, Japanese learners of English, lexical network.*

1. Introduction

Much research has been done to explicate how and how much extensive reading in a foreign language can contribute to the lexical acquisition of the language (Cobb, 2007; Horst, et al., 1998; Hulstijn & Laufer, 2001; Krashen, 2004; Laufer & Hulstijn, 2001; McQuillan & Krashen, 2008; Pigata & Schmitt, 2006; Waring & Takaki, 2003; Webb, 2008). Although Horst et al. (1998) claimed the limitation of extensive reading as a method of expanding L2 vocabulary, especially for early stage learners, they also mentioned the possibility for learners to enrich their knowledge of the words they have already acquired, and to build network linkages between words through extensive reading. Pigada & Schmitt (2006) suggested that various aspects of word knowledge should be treated differently when effectiveness of vocabulary acquisition through reading is discussed, implying Nation's (2001) nine categories of lexical knowledge. Waring & Takaki (2003) suggested to the series editors of graded readers that they should not only be overly concerned with presenting new vocabulary but also provide a rich input of already known vocabulary with a variety of collocations and colligations. Although these studies have been mainly focusing on acquiring new words, some of them mentioned the important role of reading as a method of deepening vocabulary knowledge. It can be assumed that learners are provided with ample opportunities to incidentally acquire new information about familiar words as well as unfamiliar words through reading, which enables them to establish interwoven associations among those words.

It is widely acknowledged that one of the important aspects of lexical knowledge is how words are organized into a structured whole. However, how such organization is achieved, or how learner's lexical knowledge can be assessed in this structural aspect has not been sufficiently explicated (Wilks & Meara, 2002). In our previous study (Aotani & Takahashi, 2021), we compared Japanese EFL learner's

lexical knowledge before and after undertaking extensive reading tasks. Participants were divided into three groups, each of which was given the same reading material but with different tasks, translation task, multiple-choice question task, and no task (as a control group). The results revealed that participants in the translation task group tended to find the relationships between the words more easily than the participants in other groups, and they were also more aware of changes in their own ability to recognize word association. We tried to interpret the result in terms of the Involvement Load Hypothesis proposed by Laufer & Hulstijn (2001). Their hypothesis, which was inspired by the notion of depth of processing theorized by Craik and Lockhart (1972), proposed a motivational-cognitive construct of involvement, consisting of three basic components; *need*, *search*, and *evaluation* (see also, Hulstijn & Laufer, 2001). Three degrees of prominence are suggested for each of the three components; *no*, *moderate*, and *strong*. In terms of the involvement load, participants in the translation task group in our study should have been in the highest involvement index among the three groups. According to Laufer & Hulstijn's (2001) findings, the greater the involvement load, the better the retention of new words. Although our study did not focus on the acquisition of new words but the association between already known words, their hypothesis could be applied to the results of our study in terms of the depth of processing.

The present study aims at extending the above discussion by employing a more systematic experimental setting. We made two improvements to the previous study. First, tasks assigned to three groups of participants were modified based on the involvement load. The three kinds of task were multiple-choice questions (MCQ), MCQ plus fill-in-the-blank questions (MCQ+FB), and MCQ plus composition (MCQ+Com). According to Hulstijn & Laufer (2001), *evaluation* induced by these tasks is MCQ=*no*, MCQ+FB=*moderate*, and MCQ+Com=*strong*. Since this study targeted only already known words, no tasks induced *search*. Therefore, the learning outcome, which is measured by the degree of lexical relations among some target words in the passage, was presumed to be higher in order of MCQ+Com, MCQ+FB, and MCQ. The second improvement is that we added an investigation of participant's intrinsic motivation for the task. Hulstijn & Laufer (2001) indicated that the task based on learner's own necessity would elicit *strong need*, while the task directed by the other is to elicit *moderate need*. Thus, we measured participant's intrinsic motivation by the originally-developed questionnaire after finishing the task, and examined its effect on the learning outcome. Participants with higher intrinsic motivation were assumed to have *strong need* and to show a better learning outcome than those who with lower intrinsic motivation.

2. Method

2.1. Participants

Fifty-two Japanese university students (34 males and 18 females; ranging from 19 to 22 years old excluding one male aged 34) participated in the experiment with informed-consent. Their English proficiency level was 445.5 (SD 90.6) points on the TOEIC score. They were randomly divided into three groups (see 2.3).

2.2. Materials

As a reading material, we chose a passage about medicine safety from the McGraw-Hill's textbook of Health for fourth graders (word types 149, word tokens 319). It was divided into two halves that have different kinds of lexical network, and we chose target words to be examined in each half. From the first half, one keyword (*treatment*) and five relating words (*seek*, *harmful*, *find*, *right*, *choose*) that collocate with *treatment* were chosen. From the second half, another keyword (*medicine*) and five relating words (*affect*, *take*, *cause*, *use*, *dependent*) that collocate with *medicine* were chosen.

2.3. Procedure

The experiment consisted of three parts.

Part 1: The participants were asked to judge the degree of relationship among two sets of six target words (1 keyword and 5 relating words) mentioned above (Test 1). At that time the reading material was not shown to the participants. In order that data can be analyzed in terms of the asymmetrical relationship between two words (AMISESCAL; see 3.2), a perceived relationship of $word_A$ toward $word_B$ and that of $word_B$ toward $word_A$ were separately measured. That means all permutated pairs out of six words (i.e., 30 pairs) were prepared, and the participants judged 60 pairs in total. The degree of relationship was measured by a 6-point Likert scale from 1: 'not related at all' to 6: 'strongly related.'

Part 2: A week after Part 1, the participants were required to read the passage without dictionaries and do the assigned task. The task for MCQ group was to answer four multiple-choice questions (MCQ) about the contents of the passage. The task for MCQ+FB group was to answer the MCQ and ten fill-in-the-blank questions in the passage. Blanks corresponded to ten relating words, which

were given as a word list. The task for MCQ+Com group was to answer the MCQ and to make ten English sentences using the relating words. After finishing the task, participants in all groups answered ten questions asking about their intrinsic and extrinsic motivations for the task on a 7-point Likert scale. Then, they did the same words-relationship test as in Part 1 (Test 2).

Park 3: A month after Part 3, all participants did the words-relationship test for the third time (Test 3).

3. Results

3.1. Quantitative analysis

Ratings for the words-relationship test were averaged for each participant and each test (Test 1, 2, and 3) separately for the first half of the passage (*treatment*-set) and the second (*medicine*-set). Figure 1 shows the results in each group. As regards the *treatment*-set (Figure 1a), two-way (3 groups × 3 tests) analysis of variance (ANOVA) showed a significant main effects of the group-factor (F=3.68, df=2,49, p=.032,η^2=.131) and of the test-factor (F=8.67, df=2,98, p<.001,η^2=.150). Post-hoc analysis revealed that ratings in MCQ+FB group was significantly higher than those in MCQ group, and ratings of Tests 2 and 3 were significantly higher than those of Test 1. The interaction between the two factors was not significant. The same ANOVA for the results of the *medicine*-set (Figure 1b) showed no significant main effects nor interaction.

Figure 1. Relationship score in each group and each test for the treatment-set (a) and medicine-set (b).

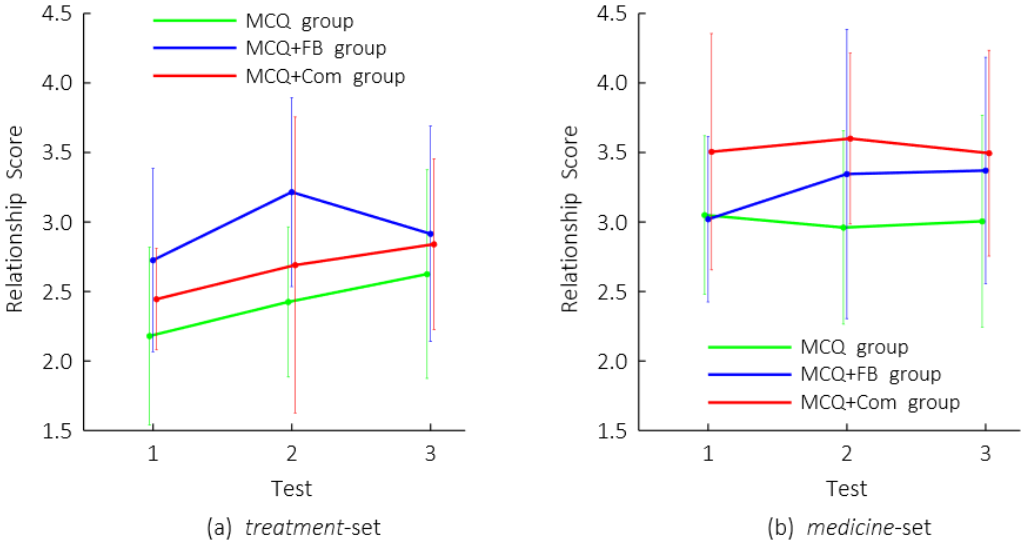
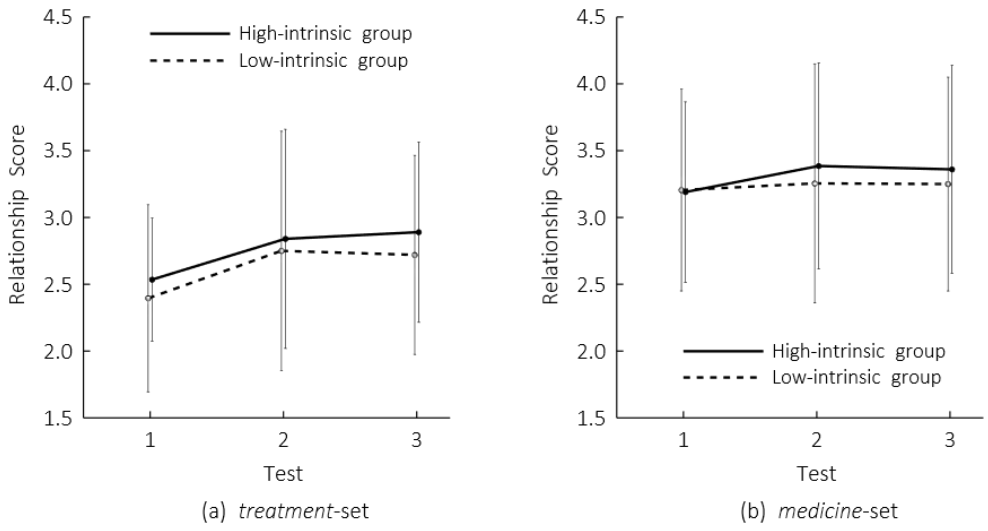


Figure 2. Relationship score in each group and each test for the treatment-set (a) and medicine-set (b).

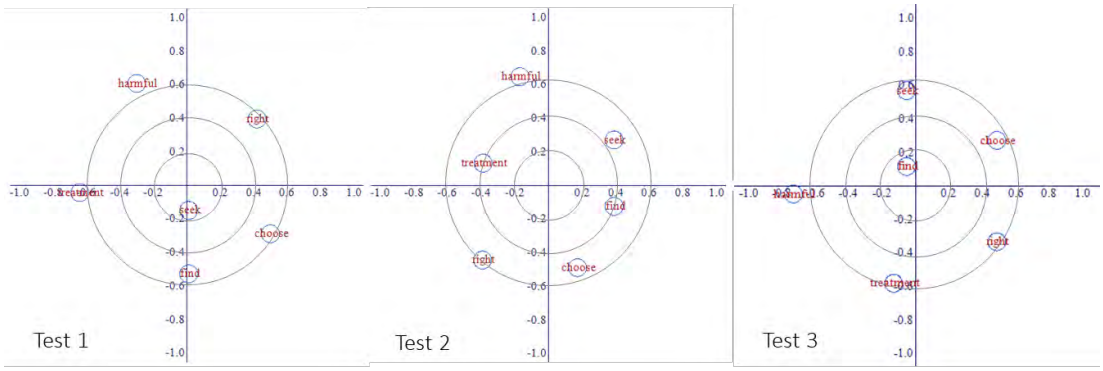


Next, we analyzed the effect of participant's intrinsic motivation on the learning outcome. Since the interaction between the group-factor and the test-factor was not significant, we pooled the data in all groups for subsequent analysis. First, data of the motivation questionnaire were subjected to a factor analysis (principal factor method, Promax rotation), and two factors were obtained, namely intrinsic motivation and extrinsic motivation. Then, for each participant, ratings for question items that were highly loaded by each factor were averaged to make an 'intrinsic score' and 'extrinsic score,' and the 'intrinsic index' was calculated by subtracting the 'extrinsic score' from the 'intrinsic score.' Next, we divided all participants into a high-intrinsic group (28 participants whose intrinsic index ranging from 0.17 to 4.00) and a low-intrinsic group (24 participants whose intrinsic index ranging from -3.33 to 0.00). Figure 2 shows the results in each group. For the *treatment*-set (Figure 2a), two-way (2 groups × 3 tests) ANOVA showed a significant main effect of the test-factor (F=8.30, df=2,100, p<.001,η^2=.142), and post-hoc analysis revealed that ratings of Tests 2 and 3 were significantly higher than those of Test 1. A main effect of the group-factor and the interaction between the two factors were not significant. The same ANOVA for the results of the *medicine*-set (Figure 2b) showed no significant main effects nor interaction.

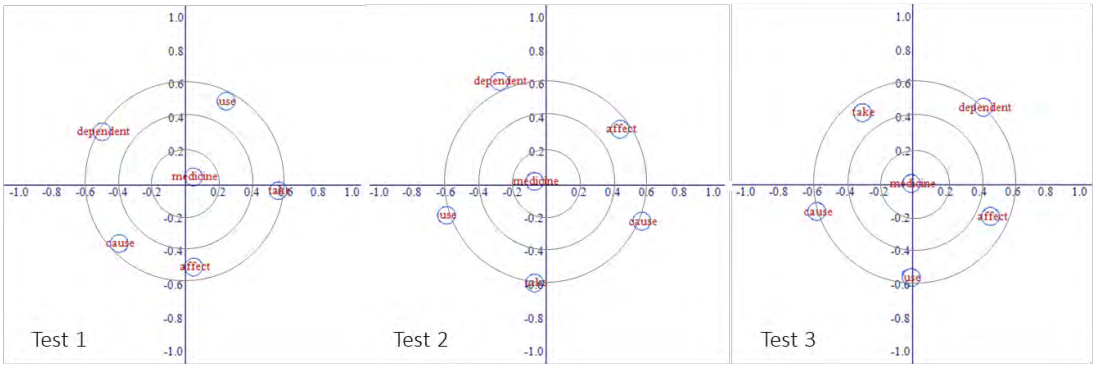
3.2. Qualitative analysis

The individual results were analyzed by AMISESCAL developed by Shojima (n.d.), which is an application of directional statistics to visualize the asymmetric structure underlying the data matrix. The great advantage of using AMISESCAL in this study is that it can visualize how learners recognize the relationship between target words. As a result, significant changes in AMISESCAL mapping from Test 1 to 3 could not be observed. There was, however, a remarkable difference between the visualized lexical networks of the *treatment*-set and the *medicine*-set. Figure 3 shows the AMISESCAL mapping using the data of all participants (from the left to the right, Tests 1, 2, and 3). On the maps of the *medicine*-set (b), the keyword *medicine* is always located at the center, indicating that the word was judged to have strong relationship with the all relating words and thus perceived as the central concept in the participant's lexical network. On the maps of the *treatment*-set (a), on the other hand, the keyword *treatment* is located in the peripheral position, suggesting that the word was failed to be perceived as the central concept in the lexical network.

Figure 3. AMISESCAL mapping of all participants' data in each test for the treatment-set (a) and the medicine-set (b).



(a) *treatment*-set



(b) *medicine*-set

4. Discussion

In the present study, we tried to observe how different involvement loads affect the association among already known words. To achieve this end, we examined the effect of *evaluation* through systematically manipulated tasks and the effect of *need* by comparing the degree of participant's intrinsic motivation. As a result, neither the task-load factor nor the motivation factor affected the learning outcome, which was shown by that there was no significant interaction of these factors with the test factor (i.e., tests before and after the task). In this respect, the present findings were generally negative in terms of the Involvement Load Hypothesis.

Meanwhile, comparing the results of two target-words sets may lead to an interesting consideration. As shown in Figures 1 and 2, in the case of *medicine*-set, there were no significant differences among different involvement loads, between higher and lower intrinsic motivation, or from Test 1 to 3. The meaning of *medicine* is unambiguous and simple, so the results suggested that the participants have already developed the lexical network of the word as shown on the AMISESCAL mapping where *medicine* is always positioned at the center. On the other hand, the word *treatment* is polysemous. The result indicated reading passages with tasks partly affected participant's knowledge regarding word association of *treatment*, but it was not enough for reorganizing the lexical network as shown on the AMISESCAL mapping where *treatment* remained in the peripheral position. This difference suggested that in order to assess the involvement load effectively, it is important to carefully choose appropriate reading material with appropriate test words. In addition, the experiments in this study were conducted in a short period of time with only one-time experience of performing the task, so further accumulation of data samples and observation over a longer period of time would be needed to prove the effectiveness of task-induced involvement load for deepening and expanding lexical network of already known words.

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