Semantic Processing and Vocabulary Development of Adult ESL Learners

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This experimental study investigates the effects of a semantic processing technique—semantic mapping—on the recognition and production of new L2 vocabulary. Two intact classes (a total of 48 students) from the English to speakers of other languages (ESOL) program in a public school in Maryland participated in this study. One of the two classes was randomly chosen to serve as the treatment group and the other as the control group. In order to investigate the effectiveness of instruction, a word recognition task and a production task were administered prior to the treatment (pre-test) and following the treatment (post-test). Results reveal that while there was a significant improvement over time between the pre- and post-test for the treatment group, the control group did not demonstrate any significant progress. More specifically, results of the study show that semantic mapping is relatively more effective in the case of receptive retrieval processes than in productive retrieval processes. This study suggests that semantic mapping can serve as an effective device in teaching L2 vocabulary.

Introduction

Teaching vocabulary in English as a Foreign/Second Language courses is receiving greater attention again after a long period when teaching structures seemed to be most important (Beck & McKeown, 2001; Carter & McCarthy, 1988; Hague, 1987; Nation, 1990). Recently, a
considerable body of L1 and L2 research suggests that automatic word recognition skills are of crucial importance in the development of reading comprehension (see Akamatsu, 2008; Fukkink, Hulstijn, & Simis, 2005; Koda, 1996; Perfetti, 1985; Vellutino, 1991). Furthermore, Nation (2001) argues that mastery of approximately 3,000 high-frequency words would enable learners to comprehend 95% of general texts they come across. The prominent role of vocabulary knowledge in learning a foreign/second language extends beyond comprehension to influencing learners’ performance in speaking, listening, and writing (Nation, 2001).

Given the importance of vocabulary in shaping learners’ proficiency in L2, research on vocabulary instruction suggests that teaching vocabulary should not be limited to teaching individual lexical items, rather it needs to include teaching of innovative techniques and strategies considered necessary to expand learners’ vocabulary and enhance their receptive and productive retrieval processes (Carter & McCarthy, 1988; Nation, 2001; Nunan, 1991; Taylor, 1990). One of these techniques is semantic mapping, which is defined as “a visual representation of knowledge, a picture of conceptual relationship” (Antonacci, 1991, p. 174). This technique embraces a variety of strategies designed to display information graphically within categories related to a central concept. Categories and their associations are represented visually using a diagram or a map to help establish word relationships (Carrell, Pharis, & Liberto, 1989). Johnson (1987, p. 19) suggests that such maps and diagrams help explain the inter- and intra-relationship between words through visualizing a sense of network among various words; hence, they “make it possible for us to experience, understand, and reason about our world.” According to Morimoto and Loewen (2007), visual representations in the form of image-schemas enhance vocabulary acquisition and improve reading comprehension, as they help learners anchor the full conceptual knowledge of any given word. In this regard, Carrell (1984, p. 334) points out that “schema theory research shows that the greater the background knowledge of a text’s content area, the greater the comprehension of the text.”

Despite the abundance of theoretical claims about the importance of semantic mapping in developing L2 vocabulary, the issue as to whether this technique can serve as a viable pedagogical device remains to be investigated. This study seeks to examine empirically the effects of
semantic mapping instruction on vocabulary development of adult ESL learners at both the receptive and productive levels.

**Literature Review**

It has been argued that vocabulary development in L1 is one of the most essential objectives of schooling (Johnson & Pearson, 1984). Carroll (1971, p. 121) suggests that “although a considerable amount of vocabulary learning is associated with primary language learning in the early years, the acquisition of most of the vocabulary characteristic of an educated adult occurs during the years of schooling.” Though the importance of direct vocabulary teaching has consistently been recognized in first language instruction, it is only gradually regaining attention in the field of second/foreign language teaching (Akamatsu, 2008; Carter & McCarthy, 1988; Morimoto & Loewen, 2007; Nassaji, 2007; Wang & Koda, 2007). Vocabulary teaching occupied a central position in the grammar-translation method but was ostensibly overlooked in the audio-lingual approach, which emphasized keeping vocabulary learning to a minimum while structures were being automatized (Coady, 1993; Larsen-Freeman, 1986).

The communicative approach to language teaching has concentrated on teaching functions of language in discourse, at the expense of teaching vocabulary, which has been de-emphasized. Proponents of this approach believe that second language acquisition vocabulary is acquired naturally from a communicatively meaningful context (Coady, 1993). According to Nunan (1991, p. 127), advocates of the communicative approach believe that “one needs not understand every word in a spoken or written text for communication to be successful.” Lack of direct vocabulary instruction is rooted in the assumption that a reader is likely to guess the meaning of unfamiliar words from context.

Until recently, L2 vocabulary has been taught because it facilitates the development of other skills such as reading and listening comprehension, “and not as a skill vital in its own right” (Judd, 1978, p. 71). Similarly, Beheydt (1987, p. 55) states that “the idea that vocabulary learning is an unmanageable appendage to structure, and function learning still remains the prevailing implicit prejudice in most EFL methods and courses.” The last few years, however, have witnessed an increasing interest in direct vocabulary teaching for its own sake in both L1 and L2.
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Central to vocabulary acquisition is the issue of how to teach new lexical items in the most effective and efficient manner. In this regard, several memory and semantic processing techniques have been proposed. Among these techniques are the keyword method, a mnemonic technique (McDaniel & Pressley, 1989; Wang, Thomas, & Ouellette, 1992), and image-schema-based instruction (IBI). Morimoto and Loewen (2007, p. 351) define IBI as “a form of vocabulary instruction in which the process of learning is mediated by the use of image-schema.” They point out that image-schemas not only help learners figure out the various senses of a particular word, they also facilitate processing the various meanings of that word in subsequent input, i.e. novel usages of the word.

In her discussion of the most effective methods involving acquisition of vocabulary, Hague (1987) suggests that the most effective methods involve teaching words in context, are intense, focused on the interests of the learner, and encourage active processing. She discusses two techniques for teaching L2 vocabulary, which seem to illustrate these features as well: semantic mapping and semantic feature analysis. Semantic mapping is defined as “a graphic arrangement showing the major ideas and relationships in text or among word meanings” (Sinatra, Stahl-Gemake, & Berg, 1984, p. 22). A semantic map may take on a variety of shapes according to the content and purpose of instruction (Carrell, Pharis, & Liberto, 1989). Advocates of semantic mapping have suggested that it is an effective technique for various kinds of reading instruction. For example, it may be used in pre-reading exercises to activate prior knowledge (content schema), and in post-reading exercises to integrate new information with prior information (Carrell et al., 1989; Kloster & Winne, 1989). Furthermore, semantic mapping may be used to enhance reading comprehension (Armbruster, Anderson, & Meyer, 1991; Reutzel, 1985; Sinatra, Stahl-Gemake, & Berg, 1984). In addition, it is suggested that semantic mapping improves recall and focuses students’ attention on the organizational structure of the text (Carrell et al., 1989; Johnson, Pittelman, & Heimlich, 1986). Finally research suggests that semantic mapping is effective as a vocabulary teaching technique (Brassell &

When semantic maps are used as a vocabulary teaching technique, the teacher chooses a central word from the text, and key ideas together with new related vocabulary words grouped and listed by categories. During discussion of the map, students become aware of the meanings of the new words, learn new meanings for old words, and discover the relationships that hold between the various vocabulary items and the ideas discussed and mapped (Hague, 1987; Johnson & Pearson, 1984).

Semantic processing techniques such as semantic mapping are characterized by two processes: first, learners focus on the meaning of the new words under study; second, they integrate these new words into their existing semantic system and their previous experiences (Brown & Perry, 1991; Hague, 1987). The concept that new knowledge is more easily acquired when it can be related to previously existing knowledge is the core principle of schema theory (Carrell, 1984; Anderson & Pearson, 1984; Rumelhart, 1980). Coady (1993, p. 11) states that

Teaching vocabulary means teaching concepts, new knowledge. Knowledge of vocabulary therefore entails knowledge of the schemata in which the concept participates, and knowledge of the networks in which that word participates, as well as any associated words and concepts.

In sum, semantic mapping enables learners to understand the relationships among words by helping them use their prior knowledge since the right “interpretation of new information hinges on its congruency with the schemata currently activated” (Nassaji, 2007, p. 82). In addition to allowing learners to relate the new words and concepts to old schemata, semantic mapping also allows learners to visually see how new words and concepts fit into their already existing knowledge structure (Hague, 1987). “Individual pieces of information cannot exist in the mind on their own … they have to be integrated into an organized and coherent global representation” (Nassaji, 2007, p. 82).

The ability to make connections between new and known information has been suggested to facilitate deep processing (Stahl, 1986), and strengthening of semantic networks has been found to lead to increased vocabulary development and reading comprehension (Beck, Perfetti, & McKeown, 1982). The inefficiency of traditional teaching techniques, on the other hand, has been attributed to the fact that such techniques do not
anchor new words and concepts to old schemata (Coady, 1993). It has been suggested that using graphics can especially help low-verbal learners overcome some language related-difficulties by providing them with information in a form which is easier to handle (Winn & Holliday, 1981). When comparing sensory-level processing with semantic-level processing, however, Craik and Lockhart (1972) found that sensory-level processing is shallower than semantic-level processing, which analyzes stimuli for meaning and relates them to existing knowledge structures. Brown and Perry (1991) suggest that a vocabulary teaching method that includes both sensory- and semantic-level processing would enhance memory more than either type of processing alone.

Not only does semantic mapping consist of a visual and a semantic component, but also a discussion component. Stahl and Vancil (1986) investigated the relationship between these components by decomposing an L1 semantic mapping treatment to its component parts. One group received a full semantic mapping treatment while two other groups received only partial semantic mapping treatment: one discussed the meaning of the words in relation to the words used on the map without the physical map; the other group studied the map without any discussion. On a multiple-choice synonym test and a sentence cloze test, both the full and discussion groups scored significantly higher than the map-only group. Stahl and Vancil concluded that the discussion component, not the presence or absence of a visual map, is the crucial factor in semantic mapping. This can be explained by what Craik and Lockhart (1972) refer to as “deep processing.” Proponents of the deep processing hypothesis claim that when learners invest more cognitive resources into vocabulary learning, they are more likely to retain the new lexical items in both the short- and long-term memory.

To understand why semantic maps could help L2 learners expand their vocabulary, one should not only evoke schema theory (Hague, 1987), but also needs to consider how words are stored and represented in the mental lexicon. It is suggested that the mind consists of “bundles of related words, united into larger bundles” (McCarthy, 1990, p. 40). Information is then attached to words as webs or nets in the mental store, with the total model being three dimensional, “with phonological nets crossing orthographic ones and crisscrossing semantic and encyclopedic nets”; encyclopedic knowledge, for its part, “relates words to the world, and brings in origins, causes, effects, histories, and contexts” (McCarthy, 1990, p. 41). As semantic mapping combines a phonological,
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and an orthographic (visual) component, it could, in light of this theory, enhance vocabulary development more than an instructional method that would only employ one of these components.

The Study

The issue of whether semantic mapping really increases vocabulary development is far from being empirically resolved. Very few studies in L1 have addressed the issue of whether semantic mapping can serve as a viable pedagogical device (see e.g., Levin, Johnson, Pittelman, Levin, Shriberg, Toms-Bronowski, & Hayes, 1984; Stahl & Vancil, 1986; Stahl & Kapinus, 1991). Although considerable claims have been made in L2 literature about the benefits of semantic mapping in vocabulary development (e.g., McCarthy, 1990; Nunan, 1991; Oxford, 1990), the paucity of empirical research on semantic mapping has not provided proponents of this technique with empirical evidence to validate their claims. Carrell et al. (1989) was one of the very few studies that investigated the effects of semantic mapping in an L2 setting. This study showed that semantic mapping correlated positively with reading comprehension. However, the issue of how, if at all, semantic mapping influences vocabulary development in its own right still needs to be fully investigated in L2 research.

It is, therefore, the purpose of this study to address the issue of how, if at all, semantic mapping influences vocabulary development in L2 when it is chosen as a pre- and post-reading activity in an adult ESL classroom. The current paper attempts to answer the following research questions:

RQ 1: Does the use of semantic mapping in L2 enhance adult ESL learners’ development of new vocabulary?

RQ 2: Does the use of semantic mapping enhance recognition of new vocabulary items (as measured by a matching task) more than its production (as measured by a cloze-type task)?

The second research question is based on the observation that receptive retrieval differs in quality from productive retrieval. McCarthy (1990) points out that “receptive retrieval involves matching spoken or written input to stored sound and orthographic patterns and their associated meanings” (p. 43) and “retrieving the appropriate meaning depends on matching verbal input with features of the context and going very rapidly to the appropriate meaning” (p. 44). Productive retrieval, on the other
hand, proceeds in the opposite direction: meaning must be given phonetic and orthographic forms. These two retrieval processes also differ in the amount of retrieval possible. According to Faerch, Haastrup, and Phillipson (1984, p. 100), there exists a continuum “between ability to make sense of a word and ability to activate the words automatically for productive purposes.” Lexical knowledge, thus, forms a continuum of semantic accessibility (Beck, Perfetti, & McKeown, 1982; Carter & McCarthy, 1988). The different character of the two retrieval processes is reflected in the different task types chosen in this study, and in the types of responses required: matching requires a selected response, whereas the cloze-type task requires a constructed response (Bachman, 1990).

**Operationalization of Semantic Mapping**

The term semantic mapping embraces a variety of strategies designed to display information graphically within categories related to a central concept. Figure 1 provides a semantic map of the word transportation.

**Figure 1. A Semantic Map of the Word Transportation**

![Semantic Map of Transportation](image-url)
As the figure demonstrates, categories and associations can be indicated in a diagram or a map. Semantic mapping can be used to introduce key vocabulary from the passage and to provide teachers with an assessment of the students’ prior knowledge and schema on the topic.

**Participants**

Two intact intermediate II classes from the English to speakers of other languages (ESOL) program in a Montgomery Country public school in Maryland were chosen for this study. One class was assigned as a control group (henceforth CG), and the other was the treatment group (the semantic mapping group, henceforth TG). The two classes were chosen for their comparable size (each class had 24 students), similarity of instruction (they used the same instructional materials), location (classes were in the same school and had the same weekly schedule), and time (the students met twice a week, two hours each, for a total of four hours of instruction per week).

The native languages of the students were Arabic, Chinese, Farsi, Russian, Spanish, Tagalog, French, and Singhalese. The ages of students ranged from 20 to 47, with an average age of 38. Approximately half of the students in each group were professionals with a post high school education, and the other half were non-professionals with at least high school education. It was not possible to determine the total amount of time each student spent studying English as a foreign language given the diverse backgrounds of the students and their varying lengths of stay in the U.S. However, all of the subjects in both groups were admitted to the Intermediate II level after successfully completing Intermediate I level in the previous semester. Students are required to take an “in-house” achievement examination at the end of instruction in each level to determine whether they will go to the next level. Students must score 80% or above on this test to advance to the next level.

**Materials**

**Instructional Source**

The main emphasis in these ESOL classes is oral communication. Listening exercise and grammatical forms are normally focused upon in relation to the oral exercises. Writing is given less emphasis, but some
writing tasks are also assigned in relation to the oral exercises and the grammatical focus of a particular lesson. Reading instruction is based on a weekly ESL newspaper (News for You) that students receive individually. The newspaper was selected by the administrators of this ESL program as a source of materials appropriate for the Intermediate II level, and because of its authenticity as a source for ESL readings. Accordingly, this newspaper was chosen as a source for the reading texts utilized in this study in order to keep the experimental procedures as nearly like the subjects’ typical classroom instruction as possible in order to minimize any disruption an experimental study may impose on regular classroom procedures.

Factors which were considered in the selection of the three articles used in instruction were: (1) articles the students had not previously read; (2) probability of new vocabulary; (3) content which would be appropriate for semantic mapping, and (4) similarity in length (1st article 307 words, 2nd article 316 words, and 3rd article 261 words).

Assessment Instruments

In order to test the effects of instruction, a pre-test and post-test design was used. The test consisted of 24 vocabulary words in two exercises. The first task was a matching test, which was used to assess the participants’ receptive knowledge of the target words. Sentences with the 12 target vocabulary words (4 from each article) were taken directly from the articles. The vocabulary items were extracted from the sentences and placed in random order in a column next to the sentences so that the students would choose the appropriate word for each sentence. Three extra words were added to the list as distractors (see Appendix A).

The second task was a cloze-type test, which aimed to assess participants’ productive vocabulary knowledge. Sentences with the 12 target lexical items (4 from each article) were also taken directly from the texts. The words were extracted from the sentences (one word per sentence), and the spaces were left blank. The purpose was to find out whether or not students would provide the exact word after they had been exposed to the target vocabulary during instruction. In choosing the 24 target vocabulary words from the three texts, special attention was paid to being particularly selective, eliminating any words that might be cognates for some students, and thereby giving them an advantage over
the other students. The selected words were of Anglo-Saxon origin that would make them unfamiliar to most of the students.

**Procedures**

To determine if the target vocabulary words were unfamiliar to participants, the classroom teachers administered the pre-test to the two groups by during regular classroom hours. Thirty minutes were allotted for the pre-test. However, most of the students finished in about fifteen minutes.

Semantic mapping instruction was provided by the classroom teacher, and instruction for the first article began during the following class meeting for the TG. As a pre-reading activity, the classroom teacher wrote a key phrase from the article on the board. Then the students suggested ideas related to the key phrase. The teacher wrote their ideas on the board, grouping them around the key phrase. No new vocabulary items were focused on at this time. The students were then asked to read the article silently. After reading the article, the students generated the ideas for the post-reading map from the information in the text. The teacher wrote the ideas on the board as the students discussed the article, and the new vocabulary items were included as the students mentioned them. If the students did not mention all of the target words, the teacher deliberately focused their attention on these new words by asking for their meanings, explaining them and writing them on the board with the appropriate ideas. Thus, all targeted words were carefully discussed in the classroom using the semantic mapping technique. After discussing the article, the students compared the pre-reading and post-reading maps. They were not asked to work on any assignments related to the articles outside the classroom.

The second and third articles were studied consecutively during the next two class meetings, and the same semantic mapping procedures were followed. The CG studied the same articles on the same days, following the daily classroom activities which consisted of the following: first, the students took turns reading small portions of each article aloud until they had read the complete article; next, the teacher read the article aloud, and the students repeated what was read. They paused after every paragraph to discuss the ideas and the new vocabulary items. Twenty to forty minutes were spent on each article in both the CG and TG. In order to simulate the natural classroom procedures as closely as possible, the
regular teachers for these classes provided the instruction. On the last
day of instruction, the students were given the post-test, right after they
had finished studying the third article.

Two weeks after the first post-test, a second delayed post-test was
given to the TG. About thirty minutes were given for the second post-
test as well. The students did not know beforehand that a second post-
test would be given. This test was given to determine if over time,
students would retain any of the vocabulary items they studied during
the treatment sessions. The second post-test was not given to the CG
because the first post-test was returned to the students and the answers
were discussed with them before the second post-test was to be given.

**Scoring**

The same scoring procedure was followed for the pre- and post-tests.
In the matching test, each correct answer was given one point, with a
maximum total of 12 possible points. In the cloze-type test, each
correct answer was also given one point, with a total of 12 possible
points. As the purpose of the test was to assess the use of the target
words, no points were taken off for spelling errors. Descriptive statis-
tics were calculated for the two tests. In order to compare the relative
effectiveness of the treatment on the acquisition of the targeted lexical
items, a series of *t*-tests were performed on the students’ scores with
the test scores being the dependent variable and the type of group
(treatment or control) and test time (pre and post) being the indepen-
dent variables.

**Results**

The *t*-test was performed on the pre-test scores of the two groups to
determine whether they started at the same level of proficiency. Test
results did not reveal any differences between the two groups at the
onset of the study (*t = .095, p = .93* for the cloze-type test, and *t = 1.23,*
*p = .24* for the matching test). Thus, one can be confident that any
gains that might have been obtained are the results of the treatment
given to the students and not due to any prior knowledge. The means
and standard deviations for the two groups on the pre-test are presented
in Table 1.
Table 1. Descriptive Statistics for the Recognition and Production Tasks for Both GG and TG

<table>
<thead>
<tr>
<th></th>
<th>Matching</th>
<th>Cloze</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>TG</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pre-test</td>
<td>0.250</td>
<td>0.707</td>
</tr>
<tr>
<td>Post-test</td>
<td>2.75</td>
<td>3.536</td>
</tr>
</tbody>
</table>

Recognition Test

Table 1 shows the descriptive statistics of the recognition test (matching task) for the two groups. Although both groups showed improvement from the pre-test to the post-test, the gain scores for the TG was larger than those of the CG. The results were submitted to a $t$-test to find out the significance of these findings. Results of the $t$-test analysis for the CG did not show any significant differences in the students’ performance from the pre-test to the post-test ($t = 1.96, p = .07$). On the other hand, results of the $t$-test showed a statistically significant difference for the TG between the pre-test and post-tests ($t = 2.91, p = .01$), see Table 2.

Table 2. Results of the $t$-Test for Both Tests

<table>
<thead>
<tr>
<th></th>
<th>CG</th>
<th></th>
<th>TG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig.</td>
<td>$t$</td>
<td>Sig.</td>
<td></td>
</tr>
<tr>
<td>Matching Test</td>
<td>1.96</td>
<td>.07</td>
<td>2.91</td>
<td>.01*</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>1.99</td>
<td>.067</td>
<td>2.11</td>
<td>.056</td>
</tr>
</tbody>
</table>

Production Test

Table 1 above presents the descriptive statistics of the production test (cloze-task) for the two groups. Results of both groups showed some improvement from the pre-test to the post-test. Results of a $t$-test statistical analysis showed that while the CG improved from the pre-test to the post-test, the improvement was not statistically significant ($t = 1.99, p = .067$). On the other hand, results of the $t$-test for the TG showed no significant difference between the pre-test and post-tests ($t = 2.11, p = .056$) (see Table 2 above).

Overall, the results showed that the scores of the TG were higher than those of the CG on both the recognition and production tests,
though the differences were significant only on the recognition task. With regard to the second post-test, which was given only to the TG, scores for the matching test showed that the students’ scores either remained the same or increased over the first post-test scores with the exception of one student whose score went down by two points. However, results of the cloze-type test showed that all students’ scores went down except for one student whose score remained the same as the first post-test score.

**Discussion**

The results reveal a very complex and rather mixed picture about the effects of semantic mapping. On the one hand, while there was a significant improvement over time between the pre- and posttest for the TG on the recognition task, the CG did not show any significant improvement between the two tests. On the other hand, no statistically significant differences were found between the two groups on the production task. Thus, with regard to the first research question, the results, contrary to theoretical claims advanced by many researchers (see e.g., Brassell & Flood, 2004), show no significant superiority for semantic mapping over the traditionally-oriented vocabulary instruction given to the CG.

There are a number of possible explanations as to why the TG did not fully differentiate itself from the CG that received traditional vocabulary instruction, particularly in the production task. First, it could be that the test types used-matching and cloze-type-are not sufficiently sensitive to detect the effects of semantic mapping instruction. The cloze-type task used was a collection of de-contextualized sentences, which principally require bottom-up processing. This could be at odds with the integrative and top-down processing nature of semantic map where the different words depicted form a unified whole (see Legenza & Elijah, 1979; Brown, 2002, for reviews of weaknesses of the cloze procedure as a measure of comprehension). We might speculate that had the testing procedure been supplemented with test devices that focused more on understanding in context, clearer distinctions between the two methods of vocabulary instruction could have been more evident.

Second, as pointed out before, Stahl and Vancil (1986) contend that it is the discussion component that makes semantic mapping work in vocabulary instruction. Knowing that the CG relied heavily on discussion of the three texts as well, the two types of instruction might have
partially overlapped. This overlap might then have ameliorated the gains of the CG. Additionally, subjects may have received too little exposure to the new vocabulary for the productive retrieval task to work well. Moreover, Nation (2001) argues that in designing a vocabulary component in L2 instruction, it is critically important to create a balance between meaning-focused input, meaning-focused output, language-focused learning, and fluency development. While semantic mapping may help with the first two components, it overlooks the other components, which are required for L2 vocabulary development. Finally, the t-test statistical analysis tends to reduce any significant differences when the sample size is small, which was the case here.

The answer to the second research question is affirmative; the results indicate that semantic mapping enhances the recognition of new vocabulary, as measured by a matching task, more than the production of words, as measured by a cloze-type task. This conclusion is supported by the fact that the TG made significant progress over time between the pre-test and post-test on the matching task only. This conclusion is further supported by the students’ scores on the second post-test, showing that the effects of semantic mapping on the recognition retrieval were maintained over time whereas the scores on the productive retrieval decreased. Moreover, when the two assessment tasks were compared, the results show that semantic mapping enhanced the recognition (receptive retrieval) of the new vocabulary items more than production (productive retrieval) of new vocabulary items. This result is in line with what is known about vocabulary development in general: the ability to recognize new words develops before the ability to produce the vocabulary.

**Conclusion**

Although various strategies have been proposed for teaching ESL vocabulary, relatively little empirical research has been carried out to test the effectiveness of different vocabulary teaching techniques, including semantic mapping. Despite the claims in ESL literature that semantic mapping enhances vocabulary development, this study provides partial support for such claims. Overall, it was shown that semantic mapping instruction was more effective than traditional instruction on the recognition test. On the other hand, the TG failed to distinguish itself from the CG. This rather surprising finding might be attributed, as indicated above, to some special performance by the CG.
resulting from the incorporation of a discussion component in dealing with the three treatment texts.

Overall, though the results of this study were less than conclusive, especially with production retrieval, it can be concluded that semantic mapping may have helped enhance vocabulary development of this particular adult ESL group. Thus, semantic mapping may still be a beneficial pedagogical devise for L2 vocabulary instruction. In particular, semantic mapping can be relatively more effective with receptive retrieval than productive retrieval. However, the results of this study should be interpreted with some caution, as the number of participants in this study was relatively small. Additionally, discourse-level, not sentence-level cloze-type tasks, should be used to better reflect the goals of communicative language teaching which emphasizes contextualization of learning tasks. Future research that utilizes discourse-based data gathering techniques is thus called for to investigate whether the obtained results hold for other contexts.

Note

1. One of the anonymous reviewers of the article argues that the matching tasks can be classified as a “productive test with choices.” The justification for this position is that “the starting point for the test is the sentence contexts. This suggests a possible meaning that needs to go in the gap and on the basis of this meaning the test taker has to select the word form from the list of options. The direction of activity therefore is from meaning to form, which is productive rather than receptive.” This position is in contrast with the views of some researcher who classify matching tasks as a receptive task (see e.g., Crow, 1986).

References


Adel Abu RADWAN received his Doctorate in applied linguistics from Georgetown University in Washington, DC. He worked as an adjunct professor at George Mason University in Virginia, USA. He is currently an assistant professor at Sultan Qaboos University in Oman, where he teaches courses in psycholinguistics, language acquisition, and theoretical linguistics. Dr. Radwan’s chief interest is focus-on-form instruction and its effects on second language acquisition.

Janna RIKALA-BOYER is a graduate of Georgetown University in Washington, D.C. Most of her work and research focuses on the reading process and reading comprehension. In particular, she investigated how to apply our conceptual knowledge of the reading process in second language instruction.
## Appendix

### The Recognition Test Given to the TG and CG

**Matching Directions:**
Choose the best word from Column B for each blank space in the sentence in column A. Use each word only one time.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Leaders of the world’s seven richest democracies agreed on steps to ______ their nations’ economies.</td>
<td>a. crowded out</td>
</tr>
<tr>
<td>2. They will speed up their ______ of $3 billion in aid to Russia.</td>
<td>b. pastime</td>
</tr>
<tr>
<td>3. ______ trading has ______ relations between Japan and the United States.</td>
<td>c. range</td>
</tr>
<tr>
<td>4. Erosion and ______ threaten many plants.</td>
<td>d. shrubs</td>
</tr>
<tr>
<td>5. The wire lettuce ______ in that area.</td>
<td>e. draws</td>
</tr>
<tr>
<td>6. It is easy enough to sow seeds of rare flowers and ______ in new places.</td>
<td>f. trade</td>
</tr>
<tr>
<td>7. The plants that grew in that area before may be ______ by the newcomer.</td>
<td>g. pledge</td>
</tr>
<tr>
<td>8. Long-distance swimming used to be a lonely ______.</td>
<td>h. lopsided</td>
</tr>
<tr>
<td>9. But one of the biggest _____ is having swim clinics.</td>
<td>i. overgrazing</td>
</tr>
<tr>
<td>10. The clubs also compete against each other in swim ______.</td>
<td>j. meets</td>
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<td>11. Members of the clubs ______ in age from 19–20.</td>
<td>k. attack</td>
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<td></td>
<td>l. died out</td>
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<tr>
<td></td>
<td>m. boost</td>
</tr>
<tr>
<td></td>
<td>n. strained</td>
</tr>
<tr>
<td></td>
<td>o. experts</td>
</tr>
</tbody>
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