Incidental Vocabulary Learning: A Semantic Field Approach

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Abstract

This study is an attempt to explore the difference between acquiring new words with different semantic fields to which they belong. In other words, the purpose of this study is to scrutinize the contribution of semantic field theory in learning new vocabulary items in an EFL setting. Thirty-eight students of three different levels of education took part in this research. They were exposed to some new words from four different semantic fields, and then they were tested on their acquisition of the words meaning. This exposure was through reading texts and the aim of reading was just comprehension, therefore the words were acquired incidentally. The outcome showed significant differences between groups with different levels of education regarding retention of words from different semantic fields.

Keywords: semantic network, incidental vocabulary learning, semantic field theory

1. Introduction

Learning vocabulary has always been one of the major areas in ESL/EFL about which massive amount of research have been conducted. To find the best way to help students retain vocabulary items for a longer time is a controversial issue, which requires even more research to crystallize.

Reading, as a skill, is best known for fostering vocabulary learning. It is widely believed that by exposing language learners to new words, which are embedded in reading passages in the target language, vocabulary acquisition will take place as a by-product of reading. This method of picking up new vocabulary items is called "incidental" vocabulary acquisition.

A large number of studies has investigated incidental vocabulary acquisition each of which has put to test a different aspect of this type of learning (e.g. Hulstijn, Hollander, and Greidanus, 1996 [5]; Laufer and Hulstijn, 2001 [7]; Paribakht and Wesche, 1999 [9]).

This study worked with the same issue, incidental vocabulary acquisition, but with a different point to focus on. In this study we tried to see whether the meaning of words, better to say, the semantic field to which they belong, makes any difference in students' acquiring them.

2. Semantic field theory

All the words that we have in our lexicon have a specific meaning, which we understand immediately when we face the word. Some of the words are more semantically related to each other than some others in a way that when we encounter one of them, the other comes to our mind, too. For example, when we hear the term *teacher,* most of us immediately think of the words *school* or *student* or when we hear the word *door,* we may think of *window* or *wall* but not *teacher* or *student.* These simple examples show that these words belong to different categories that all of us superficially can recognize them. This interrelationship between the words is called "semantic field" and this theory has been the focus of a great number of studies to interpret the true nature of this theory and even to investigate whether this is a general theory or just a simple co-incident.

The basis of semantic theory is strongly influenced by structuralism's point of view of language. In Saussurean structuralism "lexical field" is defined as network of words in which the meanings of words define each other and put limits on each other's meanings (Kleparski and Rusinek 2007). Following the Saussurean view other scholars tried to organize this theory in a more

structured way. German scholars introduced the first version of this theory, and during 20s and 30s, a variety of viewpoints about semantic fields emerged. Below, two of the most influential ones are briefly described.

I. Trier's semantic field theory

In 1930, Trier introduced his view of semantic field theory. Wu (1988) summarized the foundations of this theory as follows:

> a. The vocabularies in a language system are semantically related and they build up a complete lexical system. This system is unsteady and changing constantly.
>
> b. Since the vocabularies of a language are semantically related, we are not supposed to study the semantic change of individual words in isolation, but to study vocabularies as an integrated system.
>
> c. Since lexemes are interrelated in sense, we can only determine the connotation of a word by analyzing and comparing its semantic relationship with other words. A word is meaningful only in its own semantic field. (Cited in Changhong, 2010; p.51) [2]

II. Porzig's semantic field (syntactic field)

Porzig looked at the notion of interrelatedness of words from a different point of view. He put forward the notion of co-occurrence of the words. Based on this issue, some scholars call his theory "syntactic" theory.

According to Porzig (1928, 1934, cited in Kleparski and Rusinek, 2007), the meaning of words are limited in the context in which they are used and the "neighbors" which are surrounding them. As he would explain, there is a pivot (which is mostly a verb) word around which the meaning of other words is defined. Below, there is an example from Kleparski and Rusinek (2007):

ride a { *horse*, *camel*, *bike*, *donkey*, *etc.* }

As it is manifested in the example, in Porzig's theory, syntax plays a more crucial role than that of semantics.

What was worked upon in this research was related to Terier's semantic field because here we focused on the meaning of the words not on the syntactic context in which they were placed.

3. Review of literature

The amount of research conducted on the theory of semantic field and its implications in ESL/EFL is not that large. One of the reasons of this lack of research is that, there are several versions of this theory that make it difficult to define the research question and domain of study precisely.

Despite all that, there were a number of studies trying to focus on semantic fields in the area of vocabulary learning. Crow and Quigley (1985) [4] implemented the semantic field theory to assess vocabulary learning while reading comprehension. In their research, they compared two alternative methods of teaching vocabulary incidentally using reading passages. They described the aim of their study as: "This study compares a traditional approach to vocabulary instruction with an approach based on the semantic fields of words that appeared in college-level reading texts."(p. 497). The winner of this comparison was, expectedly, the approach based on semantic field.

In another study, Lehrer (1985) tried to get some insights into lexical change by the use of semantic field theory. He would explain that, lexical changing is not an independent process for each single word; instead, we should look at the issue in a broader viewpoint. Every word belongs

to a specific semantic field and the change that occurs to the meaning of a word through time, should be studied by keeping an eye to the changes that occur in the according semantic field.

Kleparski and Rusinek (2007), too, developed a study to investigate the effect of semantic field of words on their change over time.

There were also some studies based on Porzig's view of semantic field. Schmitt (1999) [12] developed a research to assess the vocabulary part of the TOEFL test. He scrutinized how deeply the questions in this test, were understood regarding the "association, collocation and word class knowledge" (p. 189). The result showed the lack of ability of the TOEFL test to help students reach this deeper level of understanding of the words under question in the test.

Chonghong (2010) explored the contribution of semantic field theory in vocabulary instruction. His study contains both types of semantic field theory explained above. He worked upon semantic part of the theory and focus on the relationships between word meanings like hyponymy and antonym and at the same time brought into consideration the syntactic part of the theory. In this regard, he employed some techniques to assess vocabulary acquisition in terms of collocation and metaphors. He would describe the results as follows:

The study is of pedagogical significance in that it helps to enlarge learners' vocabulary by constructing paradigmatic relations of new items and to deepen learners' mastery of vocabulary, mainly connotation and collocation, by constructing *syntagmatic* relations of the new items (p. 50).

4. Research question

This research tried to find out a reasonable answer to the following question:
Do students of different levels of academic education tend to retain words belonging to a specific semantic field longer?
Hypotheses:

1) Students of higher level of education tend to retain academic words the best.
2) These students tend to retain words about travelling abroad better.
3) Students of mere school level education tend to remember words about Iranian culture best.

The first two hypotheses are based on some observation of the recent social condition of Iranian society. The academic course books, which are taught at universities in Iran, are abandoned with English academic words, which are an evidence to claim the first hypothesis to be true. In addition, in recent condition of our society, a great number of the students in higher education tend to travel abroad to continue education. Hence, the hypothesis 2 can be considered to be true. The third hypothesis is in the complimentary position to the other two.

5. Methodology

This research is a quasi-experimental research, which is designed in a "pre-test, post-test, control group" design.

There were three intact classes, which as a whole contained 38 learners. These learners were from three different educational levels. The students with different academic levels of education were not distributed to the classes according to their educational level. In other words, all three classes contained students of all three levels. The level of proficiency in English language was the same among all the participants, only their level of academic education varied.

The first phase of the research was to gain a homogenous group of participants. In order to reach it, the students first took a pre-test of vocabulary items under study. After making sure that the groups are comparable in terms of their vocabulary knowledge, the treatment started.

In five consecutive days, the students worked on five reading passages each of which contained some of the target words.

The third phase was the post-test. The participants were tested of their retention of vocabulary items to which they had been exposed. The results of the post-test were put to ANOVA

tests and comparisons between the scores of students of different educational level were drawn. These comparisons were intended to interpret whether students of different educational levels tended to remember words of a specific semantic field better.

I. Participants

There were 38 participants placed in three different classes. They were students of elementary level of proficiency and they were studying in a private language school in capital Tehran, Iran. The age range of the learners was between 20 and 35. They were of three different levels of academic education: high school, undergraduate, post-graduate. The number of students in each group was: 12 students of high school education, 22 students of undergraduate level, and the four rest were of post-graduate academic level. Their English class met for one hour and a half, five times a week.

They were all pretested in advance to see whether they build a homogenous group in terms of their vocabulary knowledge.

II. Target words

There were 24 words selected each of which belonged to one of four different semantic fields. These fields were defined as: words related to Iranian culture, academic terminology (mathematical and biological), words related to American culture and history, and words related to traveling abroad. Each of the fields contained six words out of the whole 24.

III. Pre-test

The pre-test was intended to make sure that all the students make up a homogenous group. This test was a simple list of the 50 words out of which 24 were the target words and the rest played the role of distracters. The participants were supposed to write the meaning of any word that they know in their L1.

The results of this test were put to a Test of Homogeneity (Leven) to investigate the equality of variances between the groups. The results proved the comparability of the students regarding their vocabulary knowledge.

IV. Treatment

The treatment phase started after the results of the Test of Homogeneity supported the equivalence of the groups.

The target words were embedded in five different reading passages. The words were glossed in the margin of the text with a simple and familiar equivalent in students' L1, Persian (Farsi). The texts were about different subjects and they were taken from websites. The text, then revised to contain the target words.

The participants were not told in advance that they would be tested on their gain of vocabulary items. This is one of the definitions of incidental vocabulary learning in which the students read the text for the sake of reading not for vocabulary learning, but later they are tested to see the level of their retention of vocabulary items.

This study was intended to assess the contribution of semantic field theory in incidental vocabulary learning. According to this intention, students for the sake of reading comprehension not to learn vocabulary worked on the reading passages.

The procedure was as follows:

Each day the participants were given one of the passages to read at home. They answered the comprehension questions and wrote a short summary of the text. The day after, a few of them spoke about the text in the class.

All these activities were planned just for the students to be more engaged with the text and subsequently more exposed to the target words in the text.

After five sessions of treatment, the students took the post-test.

V. Post-test

The post-test was a multiple-choice test containing 50 items. These items were all fill-in-the-blank sentences with four choices provided to choose from them. The 50 words that were put to the test were the same words as listed in the pre-test.

The researchers using some model test, taken from the Internet, developed the test.

The test was put to a pilot testing. Twenty-five students of the same level of the level of the participants took the exam and the reliability of the test was calculated using the SPSS software and the value obtained was .68. This value could have been higher if the number of students taking the pilot exam was larger. Unfortunately, it was not feasible for the researchers to reach a bigger number of the students to take part in the pilot testing.

6. Data analysis

I. ANOVA analysis

The data obtained from the post-test was put to four ANOVA tests. Each test compares the performance of all three groups of students on retention of words of one of the semantic fields.

Table 1 shows the basic descriptive statistics of the scores of the students. In this table, the number of the students and the mean of their scores along with the other statistical variables are described.

Table 1: Descriptive statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Iran	High school	12	3.5833	.90034	.25990	3.0113	4.1554	2.00	5.00
	BA	22	3.2273	.86914	.18530	2.8419	3.6126	2.00	5.00
	Above BA	4	3.2500	.95743	.47871	1.7265	4.7735	2.00	4.00
	Total	38	3.3421	.87846	.14251	3.0534	3.6308	2.00	5.00
Academic	High school	12	2.5833	.90034	.25990	2.0113	3.1554	1.00	4.00
	BA	22	4.3636	.72673	.15494	4.0414	4.6859	3.00	5.00
	Above BA	4	5.0000	.81650	.40825	3.7008	6.2992	4.00	6.00
	Total	38	3.8684	1.18939	.19294	3.4775	4.2594	1.00	6.00
Travel	High school	12	2.5833	.99620	.28758	1.9504	3.2163	1.00	5.00
	BA	22	3.2273	.68534	.14612	2.9234	3.5311	2.00	4.00
	Above BA	4	2.2500	1.25831	.62915	.2478	4.2522	1.00	4.00
	Total	38	2.9211	.91183	.14792	2.6213	3.2208	1.00	5.00

the US	High school	12	2.0000	.85280	.24618	1.4582	2.5418	1.00	3.00
	BA	22	3.1364	.99021	.21111	2.6973	3.5754	2.00	5.00
	Above BA	4	3.5000	1.29099	.64550	1.4457	5.5543	2.00	5.00
	Total	38	2.8158	1.11149	.18031	2.4505	3.1811	1.00	5.00

In this table, we can see that the high school level students scored the best on the words related to Iranian culture. The undergraduate students scored highest on the words of academic semantic field. Moreover, the students of graduate level scored highest, again, in the academic word retention.

To make reliable interpretations, the results were put to ANOVA tests. Table 2 shows the results of these tests.

Table 2: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Iran	Between Groups	1.022	2	.511	.650	.528
	Within Groups	27.530	35	.787		
	Total	28.553	37			
Academic	Between Groups	30.335	2	15.167	24.121	.000
	Within Groups	22.008	35	.629		
	Total	52.342	37			
Travel	Between Groups	5.233	2	2.616	3.587	.038
	Within Groups	25.530	35	.729		
	Total	30.763	37			
the US	Between Groups	12.120	2	6.060	6.314	.005
	Within Groups	33.591	35	.960		
	Total	45.711	37			

The outcome of the ANOVA tests produces the following findings:

- The words related to Iranian culture: as it is displayed in Table 2, the difference between the three groups of the students is not significant, because the Sig. value obtained is .528, which is much larger than the confidence interval of .05. Therefore, all three groups performed the same on the words of this semantic field.
- The words related to academic field: the Sig. value here is .000, which is lower than .05. According to this result, there is significant difference between the three groups in retaining new words in this semantic field.
- The words about traveling abroad: the difference between the groups is significant because the Sig. value here is less than .05 (.038).

- The words related to American culture: here, too, the difference between three groups is significant because the Sig. value is .005 (less than .05). Where this differences lies will be explained in the next section (post-hoc analysis).

II. Post-hoc analysis

The ANOVA tests showed us that in three semantic fields out of four, there was significant difference between the groups. To explore between which groups this difference is noticeable, the results of the post-test were put to a Scheffe's test. Table 3 displays the result of this test.

Table 3: Scheffe's test

Dependent Variable	(I) education	(J) education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Iran	High school	BA	.35606	.31828	.541	-.4576	1.1697
		Above BA	.33333	.51205	.810	-.9756	1.6423
	BA	High school	-.35606	.31828	.541	-1.1697	.4576
		Above BA	-.02273	.48208	.999	-1.2551	1.2096
	Above BA	High school	-.33333	.51205	.810	-1.6423	.9756
		BA	.02273	.48208	.999	-1.2096	1.2551
Academic	High school	BA	-1.78030*	.28457	.000	-2.5078	-1.0528
		Above BA	-2.41667*	.45782	.000	-3.5870	-1.2463
	BA	High school	1.78030*	.28457	.000	1.0528	2.5078
		Above BA	-.63636	.43102	.347	-1.7382	.4655
	Above BA	High school	2.41667*	.45782	.000	1.2463	3.5870
		BA	.63636	.43102	.347	-.4655	1.7382
Travel	High school	BA	-.64394	.30650	.125	-1.4275	.1396
		Above BA	.33333	.49310	.797	-.9272	1.5939
	BA	High school	.64394	.30650	.125	-.1396	1.4275
		Above BA	.97727	.46424	.124	-.2095	2.1640
	Above BA	High school	-.33333	.49310	.797	-1.5939	.9272
		BA	-.97727	.46424	.124	-2.1640	.2095
the US	High school	BA	-1.13636*	.35157	.010	-2.0351	-.2376
		Above BA	-1.50000*	.56561	.041	-2.9459	-.0541
	BA	High school	1.13636*	.35157	.010	.2376	2.0351
		Above BA	-.36364	.53250	.793	-1.7249	.9976
	Above BA	High school	1.50000*	.56561	.041	.0541	2.9459
		BA	.36364	.53250	.793	-.9976	1.7249

*. The mean difference is significant at the 0.05 level.

The outcome in Table 3 can be interpreted as follows:

- The words related to Iranian culture: we saw in ANOVA test that there is no significant difference between three groups regarding this group of words.
- The academic words: according to the table, we can conclude that the difference between high school and undergraduate is significant so is the difference between high school and graduate students. However, there is no significant difference between undergraduate and graduate students in this semantic field retention. It means that the students of high school level of education performed significantly lower than the other two groups regarding the retention of words of academic semantic attribute.
- The words related to traveling abroad: no significant difference can be observed between any of the *single pairs* of groups.
- The words related to American culture: regarding this group of words, the difference lies between the high school group with the other two groups. However, there is no significant difference between two other groups.

7. Discussion

By combining the outcomes of all three tables above, we can investigate supporting or rejecting the three hypotheses mentioned earlier:

- Hypothesis 1: this hypothesis is supported because the difference of the graduate and undergraduate students with high school students was significant. Besides, according to Table 1, the graduate students performed highest on the test of words related to academic field. It can be concluded that the higher the education level, the better retention of new academic words.
- Hypothesis 2: this hypothesis was supported because the difference between the groups was significant (Table 2).
- Hypothesis 3: this hypothesis cannot be supported because there was no significant difference observed between the groups regarding the words related to Iranian culture. However, the high school group performed the best on this part of the test among the other groups and at the same time, their best score was that of this word group. This outcome can open a path for further research, which may support the hypothesis.

In a general look at Table 1, we can compare the overall performance of the participants on each of the four parts of the test.

The mean score of the academic part of the test was the highest among the others (3.86). This is clearly because of the larger number of the students who were in higher education in comparison to the high school students.

The highest mean score, after that of academic part of the test, belongs to the words related to Iranian culture.

To discuss the reason of this finding we can refer to Ausubel's subsumption theory (1965, cited in Brown, 2007) [1]. If we combine this theory with Trier's semantic field, we find a proper reason for this finding.

Ausubel's meaningful learning views the human's cognition as a set of networks. When a new piece of knowledge enters our cognitive system, it should hang on some already existing knowledge and "subsume" under this field if it is intended to retain for a long time. Regarding the present study, we can conclude that Iranian students have already had the underlying knowledge about Iranian culture, so when they are exposed to some new words about their own culture this new piece of knowledge subsume well under the existing knowledge and retain longer. This reason can explain the insignificancy of the difference between the groups: all the participants are from the same cultural background; therefore, they are expected to perform the same on this part of the test.

8. Conclusion

Semantic field theory can have considerable contribution in ESL/EFL theories. This study was very limited regarding the number of participants and the number of words under study. Furthermore, the categorization of the students according to their mere level of academic education

can be considered too superficial. Therefore, there is a path leading to further research with more scientific categorization of the participants and more precise grouping of words into various semantic fields.

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